A window open on the world

The UNESCO Courier

December 1971 (24th year) - U.K.: 10p - Canada: 40 cts - France: 1.20 F

S.O.S. ANGKOR

Photo © Henri Stierlin, Geneva

Water-nymph

Half-nymph, half-angel, the Apsara or Devata of Angkor look down in their hundreds from the temple walls to gladden the heart and eye. Above, detail of a Devata from the temple of Banteay Srei (the "women's citadel"), situated twelve miles from Angkor and dedicated to Siva. Built by a humble Hindu priest who was tutor to two royal princes, the temple is a miniature masterpiece with its exquisite carvings of these delightful angel-nymphs formed from pink sandstone and never more than 70 cms. high. (See also pages 11, 21 and 26).

The UNESCO Courier

DECEMBER 1971
24TH YEAR

PUBLISHED IN 13 EDITIONS

English
French
Spanish
Russian
German
Arabic
U.S.A.
Japanese
Italian
Hindi
Tamil
Hebrew
Persian

Published monthly by UNESCO

The United Nations
Educational, Scientific
and Cultural Organization

Sales and Distribution Offices
Unesco, Place de Fontenoy, Paris-7e.

Annual subscription rates : £1 stg.; $4.00 (Canada); 12 French francs or equivalent; 2 years : £1.80 stg.; 22 F. Single copies : 10 p stg.; 40 cents : 1.20 F.

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The UNESCO COURIER is published monthly, except in August and September when it is bi-monthly (11 issues a year) in English, French, Spanish, Russian, German, Arabic, Japanese, Italian, Hindi, Tamil, Hebrew and Persian. In the United Kingdom it is distributed by H.M. Stationery Office, P.O. Box 569, London, S.E.I.

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The Unesco Courier is indexed monthly in the Readers' Guide to Periodical Literature, published by H. W. Wilson Co., New York, and in Current Contents - Education, Philadelphia, U.S.A.

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N° 12 • 1971 MC 71-2-272 A

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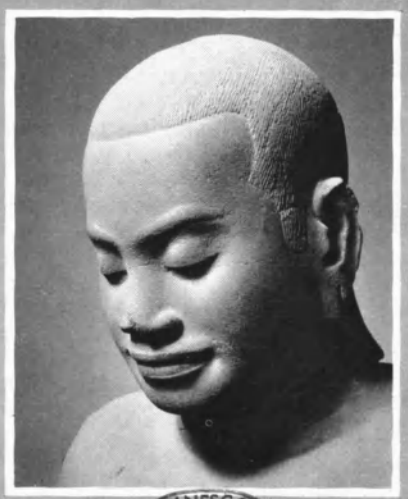


UNESCO ARCHIVES

Cover

Buried in the jungle and forgotten for centuries, then patiently restored during the 20th century, the temples of Angkor are threatened by the present conflict in South-East Asia. Cover photo shows the great Khmer monarch, Jayavarman VII, who pacified Cambodia at the end of the 12th century and under whose guidance Khmer culture reached a pinnacle of development.

Photo © Luc Ionesco, Paris

Angkor is in danger. The shadow of war threatens this great architectural complex, steeped in history and breathtaking in its beauty. Angkor, along with a large number of other Khmer sites of ancient Cambodia, makes up an irreplaceable cultural heritage which Unesco, dedicated to the protection of the world's great cultural monuments, is seeking to safeguard. The Unesco Courier dedicates this issue to the Khmer artists who, from the ninth to the thirteenth century and later, succeeded in creating one of the most extraordinary examples of the marriage between architecture and space.

by Hiroshi Daifuku

IN the classic civilizations of ancient Greece and Rome creative thought and work were recognized and appreciated. Outstanding monuments and works of art were visited then just as tourists today include famous sites and monuments in their itinerary.

Of the hundreds which existed, seven were considered to be outstanding and called the "Seven Wonders of the World". Of these a few traces have survived to the present, but the fame of those which have disappeared still lingers.

Today, more than seven would be recognized throughout the world, and surely within that limited group would be found Angkor Wat. The news that it had been damaged made headlines in the world press and aroused demands that it should be protected from further injury.

Angkor Wat is but one of many sites and monuments surrounding the Tonlé Sap, the great natural flood reservoir of the lower Mekong and its tributaries, in the Khmer Republic. Annual monsoon rains result in a great expansion of the lake, and as it recedes in the dry season fertile silt is deposited and the land becomes ready for the cultivation of rice and other crops. Fish abound and contribute protein to the diet. Even today 2,000 square miles of farm land are flooded annually.

This easily exploited wealth was the foundation for the growth of an urban civilization, and major empires rose and fell, to be succeeded by others. Each left traces of its existence. Ancient cities, temples and palaces (some still buried under dense tropical vegetation), bear mute witness to former glories of the Khmer people.

Bas-reliefs carved on walls of stone depict a triumphant procession, captives taken in war, the pomp and ceremony of royal courts. Statues of Siva, Vishnu and other deities of the Hindu pantheon, and of Bodhisattvas, or future Buddhas, record the images of long dead kings, queens, princes and dignitaries apotheosized as gods.

Frequently the sculptors succeeded "in merging man with god", in giving their creations a transcendent quality which contemporary visitors respond to though they may be ignorant of Khmer history and of the religious and cultural traditions from which these monuments were created. Of all the complex of monuments known collectively as Angkor, the masterwork is Angkor Wat. It was built in the 12th century A.D. during the lifetime of King Suryavarman II and eventually became his mortuary temple.

French archaeologists, historians and architects have worked for years in Cambodia (today the Khmer Republic). Part of the legacy of the Ecole Française d'Extrême-Orient rests in the monuments which have been excavated, studied and restored. Khmers have also been trained and now staff the national and provincial museums and services responsible for the protection of sites and monuments. Several thousand sites have been identified and thousands have still to be discovered.

MUCH remains to be done; before the recent outbreak of conflict, Unesco sent an architect-restorer to begin work on a group of sites 150 kilometres east of Angkor, which ranged in time from the seventh century to about the end of the thirteenth.

Other experts were sent to assess the expenditure required for the development of such sites.

Cultural tourism was already an important factor in the economy of the country. Siem Reap now has a modern airport which can receive jets, and new hotels have been built or were under construction in 1970. The development of sites away from Angkor would have encouraged visitors to stay longer in the country and the resultant increase in income would have helped to justify the budget required for research and restoration. The outbreak of armed conflict has, of course, put all of these plans in abeyance.

This is not the first time that Angkor has been menaced by armed conflict. A period of unrest followed the death of Suryavarman II, the weakened kingdom fell to the Chams and Angkor was pillaged in 1177. Successive kings restored Khmer rule. New construction and changes to the old took place, enriching the monumental heritage of the Khmer people.

Once again the threat of armed conflict menaces not only the people but their past heritage. Nowhere else is there greater anxiety about the preservation of Angkor. Whatever the cause of recent damage, the Government, recognizing the need for effective measures to ensure Angkor's preservation, has suggested that a neutral zone be established surrounding the monuments so that further damage will not occur as a result of military operations.

This move to protect Angkor is but one attempt in the long and turbulent history of man to preserve links with the past so that people may share a common history and tradition. The loss of such identification and continuity could lead to the eventual disappearance of an entire people.

This factor was recognized from very early times. Conquerors or would-be conquerors, in order to assure their posterity and the pride of future generations, have built monuments or destroyed those of their enemies. Rome, for example, adopted Cato's slogan "Delenda est Carthago" (Carthage must be destroyed) after the second Punic War.

The third Punic War, provoked by the Romans, resulted in the sack of the city. The site was dedicated to the infernal gods, no stone left standing, and all habitation in the ruined area forbidden. Carthage, as a city, eventually rose again, but it was no longer Punic. The survivors had been absorbed and their identity had gone forever. (See "Unesco Courier", December 1970).

During World War II, for example, after an uprising by the inhabitants of Warsaw had been repressed, Hitler ordered the complete evacuation of the city. The ancient royal castle, the old medieval section (the central market place known as the "Stare Miasto"), palaces and churches were destroyed, and much of the rest of the city was dynamited and gutted by fire.

The decision taken by the people of Poland to restore most of the monuments of Warsaw, including the "Stare Miasto", expressed their desire to recreate the fabric of the city and maintain the continuity of Polish history. (See "Unesco Courier", March 1961.)

HIROSHI DAIFUKU *is head of Unesco's Section for the Development of the Cultural Heritage. He is the author of many studies on anthropology, conservation and museography.*

S.O.S ANGKOR

The lessons learned from World War II eventually led to the preparation by Unesco of an "International Convention on the Protection of Cultural Property in the Event of Armed Conflict" which was adopted at The Hague in 1954. As in all examples of legislation it represents a compromise between the ideal and the adoption of rules which the majority of States who took part in its preparation believe that forces engaged in armed combat could be expected to observe.

The Hague Convention (1954) is now in force and over fifty States have ratified it, including the Khmer Republic. One of the provisions (Article 23) states that Unesco can be called upon for technical assistance in organizing the protection of cultural property.

At the request of the Khmer Government, Unesco sent an expert to help negotiate a cease fire to protect Angkor and permit the transfer of movable bronzes and sculptures to Phnom Penh for shelter. Later, additional experts were sent to aid and advise in the packing, transport and storage of these works of art, and the most valuable items are now adequately protected in the National Museum in Phnom Penh.

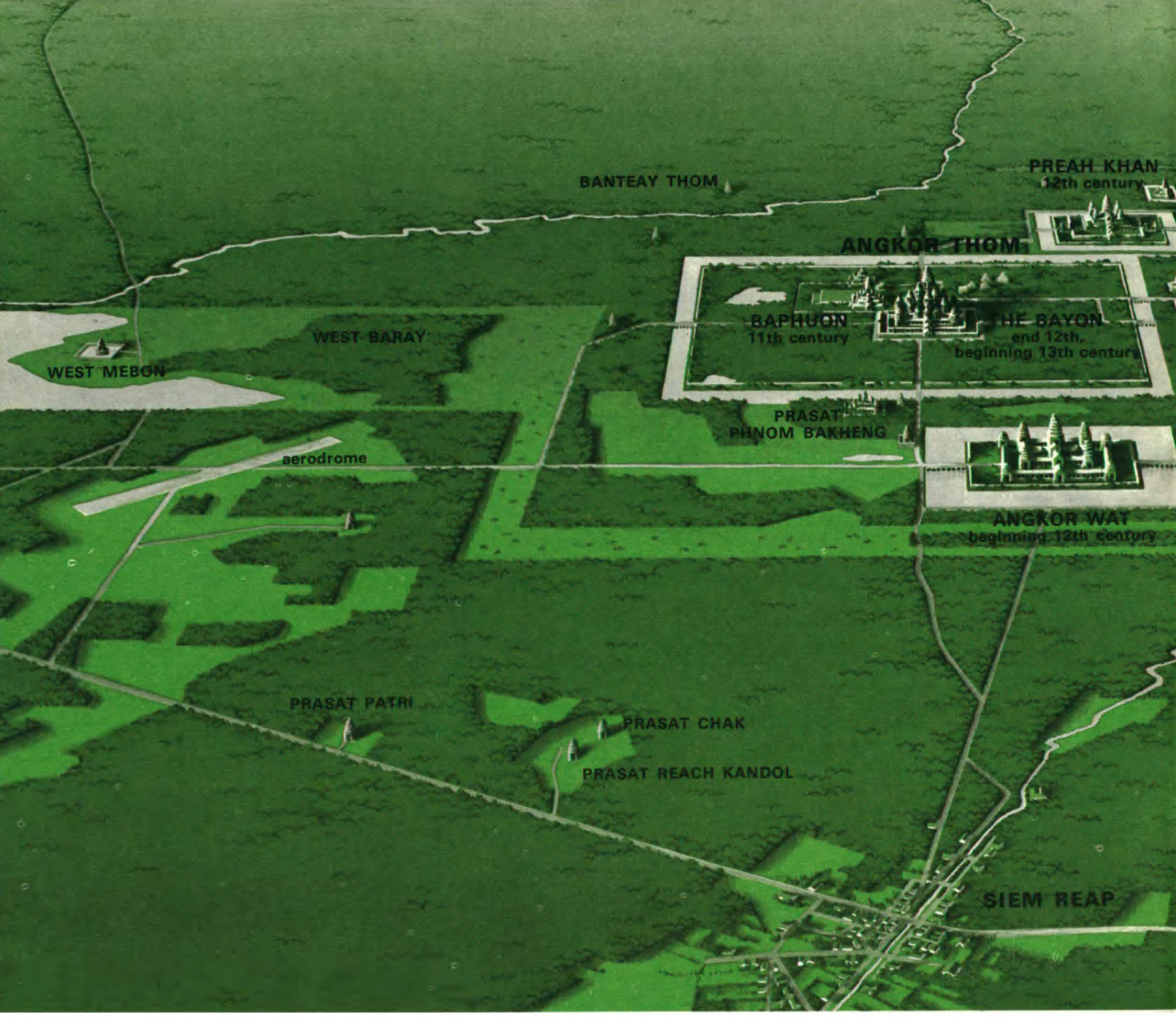
But whereas the Khmer Government has ratified the Convention the other belligerents have not. One solution would be the negotiation of special agreements so that the provisions of the Hague Convention can be applied. Should this be done, centres containing monuments of great importance could be placed under special protection (Article II). It would represent a triumph demonstrating the goodwill of all concerned.

The threat of destruction by armed conflict is immediate and dramatic. But in heavily populated centres, the pressures of population growth and short-sighted projects for economic development have resulted in far greater destruction to man's cultural heritage than that caused by either of the two World Wars and the many smaller conflicts of the past 50 years.

This too is a challenge to be met by the present generation in order that future generations shall not be deprived of cultural links with the past nor live in an environment polluted through man's excesses, whether against the atmosphere, rivers, lakes and seas or the cultural heritage of our planet. ■

Head of a buddha, damaged over the centuries, from the Elephant Terrace at Angkor Thom.

Photo © Editions Arthaud, Paris



This general view shows the site of Angkor (meaning "city") in its present forest setting. Capital of the Khmer empire from the 9th to the 13th century, the city covered an area of 600 square kilometres and boasted 600 temples. Some 100 of these temples have been cleared of vegetation and the most important ones are identified on the plan above. The prosperity of Angkor was dependent upon the construction by the Khmers of a fantastic irrigation system to support the production of rice. During the rainy season, water was stored in artificial lakes, or "barays", and a network of canals provided irrigation for an area of 1,000 square kilometres, thus providing the food supply for a population which, at its height, numbered one million. The greyish-white areas surrounding the temples or seen as rectangles are canal-works, basins and lakes forming part of the extensive Khmer irrigation system.

ANGKOR

masterpiece of architecture & town-planning

by Henri Stierlin

Drawing by Tanguy de Rémur © Paris-Match

THE city-state of Angkor is widely renowned for its splendid art and monuments; but it is worth recalling that this extraordinary artistic achievement was due, firstly, to man's resourceful adaptation to his surroundings, and secondly, to the remodelling of natural conditions by 12th century Khmer society to create an artificial environment entirely geared to intensive rice-growing.

Nowhere in the world is the full significance of the term "environment" so clearly illustrated as at Angkor. This site in Cambodia, the capital of the Khmer kingdom from the 9th to the 14th century, provides a perfect example of the way in which a civilization equipped itself with the means of producing an ample food supply without which a vigorous culture could never have flourished in the hostile setting of virgin forest and the Indo-Chinese jungle.

This article briefly describes the main influences which shaped the Angkorian civilization and its matchless architecture, recently thrown into high relief by the tragic events in South-East Asia.

The Angkor site forms a vast network of dozens of temples and satellite cities, equipped with the water supplies required for agriculture and for the day-to-day needs of the Khmer population. Thus Angkor strikes a miraculous balance between land and water, men and gods; from the fusion of these four elements emerged one of the greatest civilizations in medieval Asia.

Even before the beginning of the Christian era, the fruits of India's advanced civilization, especially in the spheres of religion and art, had begun to spread beyond its frontiers. Ceylon was the first of its neighbours to be subjected to the Buddhist influence, as early as the 3rd century B.C.

Burma, Indo-China, Java and Bali were not impregnated by the creative genius of India until the early centuries of the Christian era. The trade in exotic products between the Far East and the Roman Empire was the chief vehicle for the dissemination of the Buddhist and Hindu creeds throughout south-east Asia. The links then forged between India and the Far East endured in some instances centuries after the trading relations had ceased.

There was some sort of division into spheres of influence between India

CONTINUED NEXT PAGE

HENRI STIERLIN, *Swiss writer and T.V. filmmaker, is an expert on the history of architecture. He is editor of the series "Architecture Universelle", 16 volumes of which have been published thus far in seven languages by Editions de l'Office du Livre, Fribourg, Switzerland. The same series includes his own volume with texts and photographs entitled "Angkor". In collaboration with the noted French specialist on Angkor, Bernard Groslier, he recently produced a series of television programmes on Angkor, its art, history and development.*

Delicate balance between ecology and aesthetics

and China in this part of the world; hence the name of Indo-China acquired by the peninsula watered by three great rivers: the Menam and the Mekong, where Indian-influenced cultures flourished; and the Red River, which watered the provinces gravitating in China's orbit.

The first architecture in durable materials clearly shows the Indian influence; but a capital named Oc-Eo is known to have existed even earlier on the Bassac Delta in the lower Mekong valley. In the 3rd century A.D., it was enclosed in a rectangle 3,000 metres long by 1,500 metres wide, formed by a series of five earthworks separated by moats. The shrines in this region, known to the Chinese of that time as "Fu-nan", seem to have been built of light material (wood and thatch), and no trace of them remains.

Among the earliest monuments of which we have certain knowledge are the sanctuaries of Sambor Prei Kuk in Cambodia, a town which seems to have covered an area 2 kilometres square. Construction in this capital of the early 7th century, which dominated the unified Tchen-la empire, was on an impressive scale: the brick sanctuaries, standing in vast square enclosures, had high roofs with jutting arches; their soaring silhouettes were obtained by superposed storeys of diminishing size, forming a sequence of small temples, on a principle which recurs in all Khmer architecture.

During the 8th century, when Tchen-la had split into two kingdoms whose history remains obscure, there seems to have been little artistic development. Javanese raiders invaded Malaysia and Indo-China; and the Javanese influence was to play its part in shaping the course of Angkorian civilization.

The full flowering of Khmer architecture was preceded by an "incubation period" in the Kulens, 50 kilometres north-east of the Great Lake of Cambodia, where the capital of the kingdom was then transferred. It was as if the royal house foresaw that the destiny of the Khmers was to be played out in the heart of the country, and no longer in the southern delta, as at Oc-Eo, or to the east of the Great Lake, as at Sambor.

In this period, between 800 and 850 A.D., were laid the foundations of the art form which first emerged at Roluos in the Angkor region. At Rong Chen, in the Kulens, the first temple-mountain was built; its conception is typical of all Khmer architecture. It marries the two main architectural features inherited from India through the Javanese incursions; the stupa (an artificial mound around which Buddhists walk in ritual procession, and of which Borobudur is the most perfect example) and the Hindu shrine of superposed storeys, derived from Indian models at Mahaballipuram, for example, through the Javanese temples of Dieng or Prambanam.

Thus, the temple-mountain is a stupa crowned by a square shrine, with a roof formed of vertically superposed storeys, symbolizing the City of the Gods built on the Mount Meru of Hindu legend.

The Ak Yum temple erected north-west of Angkor just before the 9th century was a second attempt at the same effect. It seems to have been built by the Khmer King Jayavarman II, who lived for many years at the Court of the Sailendras of Java, and was responsible for establishing the royal city once and for all in the Angkor area.

The specific Khmer technique really came into its own, however, with the foundation of Roluos by King Indravarman (877-889) in the south-east quarter of Angkor. For the first time, the Indo-Chinese did more than merely dig channels to make the fullest use of the monsoon rains; they undertook a vast development scheme to improve the yield of rice, which formed the staple food throughout the whole of

Photo © Luc Ionesco, Paris

south-east Asia. This was the source of wealth to which the vast Angkorian complexes owed their construction.

Indravarman realized that to break the immutable monsoon cycle, with torrential rain for four months in the year, and not a drop falling for the following eight months, there was only one solution: to store the surplus water for redistribution in time of shortage.

It was thus possible to use the Angkorian plain to the best advantage; with abundant irrigation all the year round, it could bear as many as three rice crops a year. To this end, Indravarman initiated vast hydraulic engineering works, and created huge artificial lakes or *barays*. These formed reservoirs for the accumulation of the water needed to irrigate the rice fields.

The Lolei baray at Roluos in south-east Angkor, the earliest known example, formed a rectangular sheet of water 3,000 metres long and 800 metres wide. Dykes were used to construct this artificial lake, thus ensuring a permanent head of water—the water level was higher than the plain.

It was merely necessary to open trenches in the dykes for the water to run out at the required rate for regular irrigation of the rice fields. The baray, filled by a feeder canal and by the monsoon rains, with a storage capacity of 6 million cubic metres, was to be the source and basis of the wealth of the Khmer Kingdom.

The succeeding kings followed up this hydrological development by creating the great Eastern Baray, measuring 7,000 by 1,800 metres, built by Yasovarman about 900 A.D., then the Western Baray measuring 8,000 by 2,200 metres, which was constructed about 1050 A.D., with a storage capacity of more than 40 million cubic metres.

This vigorous technological improvement of the Angkorian plain inevitably entailed a profound modification of the landscape. The hydraulic system moulded the countryside, which was furrowed by countless irrigation channels and sub-divided by the checkerboard of the rice fields.

The Khmers had thus worked out their specific system of area development, and the plain of Angkor was to produce 150,000 metric tons of rice a year from a stretch of nearly 1,000 sq. km. This was enough to feed a population which, in the 12th century, can be estimated at 700,000 or 800,000 in the Angkor region alone, with a production surplus of about 40 per cent for export to less prosperous regions

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THE SERPENTS CAUSEWAY

Right, the final section of the axial road leading to Angkor Wat seen from the third storey of the building. 350 metres long, the raised causeway is flanked by "nagas" water divinities in the form of snakes. In the background stands the triple entrance pavilion, or "gopura", cruciform and topped with high towers now partially collapsed. On either side, the gallery extends to link the entrance pavilion to two other "gopura" (not visible in the photo) which were constructed so as to allow the passage of elephants and carts.

LOTUS-EATING ELEPHANTS

Left, the impressive Elephant Terrace of the King's Palace situated in the centre of the three kilometre square site of Angkor Thom. The Royal Road led to the palace which was built facing the rising sun. This vast frieze with its hunting scenes and life-size elephants mounted by their mahouts, all in high relief, stretches out for 300 metres on either side of the stairway to the palace, casting its reflection in the waters of the moat. At the end of the frieze, forming pillars flanking the stairway, stand the triple-headed elephants of the goddess Indra, gathering lotus blossoms with their trunks.

Photo © Henri Stierlin, Geneva

Water conservation: key to the Khmer equation

which had no similar "rice factory" to draw upon.

This artificial environment, completely dominated and largely moulded by man, was reflected in the ground plan of the towns, with their strictly right-angled lines framing the temple placed at the very heart of the city. Every part of the Khmer world was interconnected, from the embankment bordering the Cambodian peasant's rice field to the three-walled temple whose moats were linked to the irrigation system.

This is illustrated by the city of Roluos, the first great dynamic capital in the Angkor region. Indravarman was not content with constructing the Lolei baray; in 881 he built the temple-mountain of Bakong, which stood in the centre of the city then called Hariharalaya.

The temple is formed of five superposed sandstone terraces or platforms, almost square, measuring 67 by 65 metres at the base, and forming a monumental pedestal 15 metres high for the principal shrine.

The fourth storey of the temple was ringed by twelve "chapels", and eight massive brick towers *(prasats)* stood watch around the pyramid, within a precinct measuring 160 by 120 metres, surrounded by a moat 60 metres wide and about 1,500 metres round.

The dwelling-houses, made of thatch or matting, and raised on piles to protect them from the monsoon rains, bordered this first moat, and were in turn encompassed by a second moat 22 metres wide. The city formed a quadrilateral 800 metres long, with a population of some 7,000 to 8,000. Four axial avenues crossed the moats on earthen causeways to converge on the central temple, thus dividing the city into four equal parts.

The Khmer complex was thus complete: a baray supplied water to the moats in the town, with the temple-mountain or royal sanctuary at its heart. The whole constituted an interacting technological and religio-magical mechanism which ensured the prosperity of an agrarian society based on intensive rice cultivation.

That is the key to the Khmer equation; and even when the proportions of the Roluos enterprise were magnified 4 or 5 times, in Angkor, in the walled cities of Yasodharapura and later at Angkor Thom, the system remained the same. The architecture was only an embellishment of the functional hydraulic works installed for irrigation.

The temple protected and sanctified the technological achievement through the image of the deity inhabiting the inner shrine. The Khmer temple, whether dedicated to the Hindu divinities of Siva, Vishnu or Brahma, or (when the world of Angkor had nearly run its course) to the Buddha-King, represented the centre of creation, the Mount Meru which was the home of the gods (as Olympus was the haunt of the divinities in the Greek Pantheon).

The square plan of the temple, with its geometrical divisions, constituted an immense *mandala* (a mystic symbolic diagram of Indian origin), including the temple (which was thus brought into harmony with the laws of the Cosmos), the royal capital inhabited by humans (which was thus identified with the centre of the universe), and the vast expanse of the plain (which was thus dedicated to the gods). The whole panorama was quartered by the four axial avenues running from the sanctuary in each direction to be lost to sight in the perspective of the Khmer landscape.

This all-round symmetry of construction along the axial roads is a fundamental law of temple composition in the architecture of Indian-influenced countries; but only the Khmers succeeded in impressing that symmetry on the sacred edifice, on the human city and on the surrounding countryside.

This total vision of mystic symbolism and its religio-magical power, associated with the practical function of the barays and the irrigation system, is the hallmark of the Khmer genius. From this astonishing talent for synthesis, embracing all aspects of human creation, emerged the admirable apotheosis of Angkor Wat.

One of the factors responsible for the individual character of Khmer art, which differentiates it from its Indian sources, derives from the popular architecture typical of ancient Cambodia, especially the wooden dwellings built on piles and topped by gabled roofs covered with thatch. This domestic style probably dates back to prehistoric times, and is hardly distinguishable from pre-Indian neolithic building.

The popular art represented on Khmer bas-reliefs (at Angkor Wat and Bayon, in particular) inspired some typical forms of Angkorian architecture. Its influence can be detected in many instances of translation into stone of features borrowed from what were originally wooden structures.

One example is the moulded window balustrades, reproducing in sandstone the rounded lattice gratings of hut dwellings; others are the cross-gabled roofs, imitating the carpenter's technique in stone; the colonnettes bordering some raised walks, reminiscent of the traditional gangways leading to primitive dwellings beside the Great Lake: the mortise effect at the apex of doors and windows, and so on.

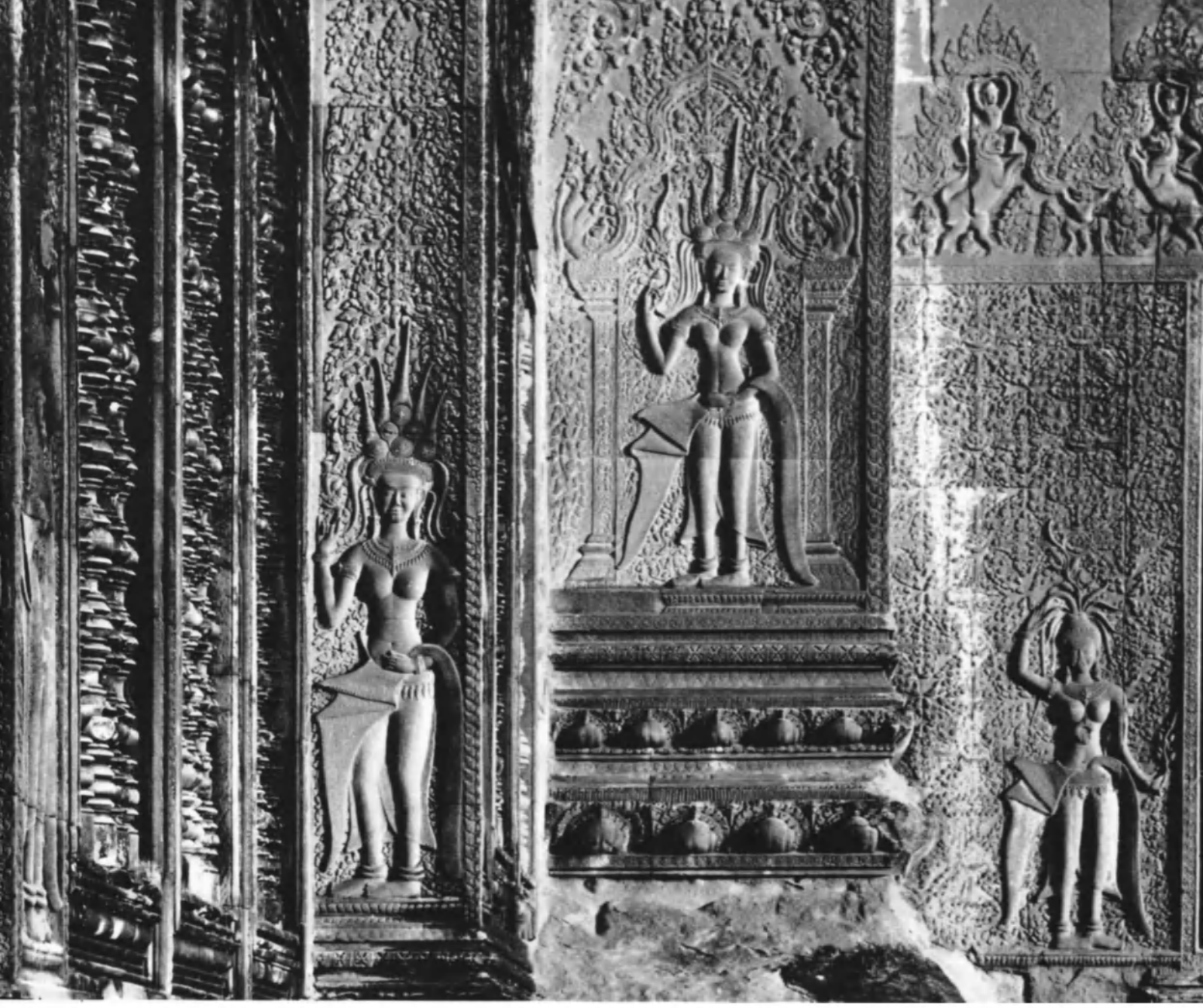
All these traits are characteristic of Khmer art, and in no way derived from Indian models. Thus, Khmer architecture drew its inspiration both from native and from Indian sources.

A rich symbolism already infused Indravarman's achievement at Roluos (the temple-mountain of Bakong); but there followed a steady development in architectural science which became more complex while also gaining in uniformity and quality. Thus, the long structures bordering the Bakong sanctuary on either side of the axial avenues began to proliferate, and even invaded the steps of the temple-mountain.

These narrow halls were soon occupying the steps of the pyramid on every side. Here we can see the inspired process of simplification

Photo © Henri Stierlin, Geneva

APSARA AND DEVATA OF ANGKOR WAT



This photograph is quite extraordinary in more than one sense. What appears to be a simple wall with several figures on it is in reality a tele-photo picture in foreshortened perspective of a 30 metre stretch of several planes of the great gallery of Angkor Wat. This gallery forms the vestibule of the temple, the biggest and best preserved of the temples of Angkor, which was built by King Suryavarman II in preparation for his eventual apotheosis. The figures with diadems and long skirts, bare-breasted in the ancient Khmer tradition, are minor divinities, known as "apsara" or "devata", destined, according to Buddhist mythology, to gladden the hearts of the Gods and the blessed ones.

which led (in the temples of Phimeanakas and Takeo) to the emergence of the encircling gallery, that essential element of classical Khmer architecture.

The long buildings were run together, the outer wall of the gallery thus formed was finally placed at the edge of each storey, the axial entrances (the Hindu *gopura*) and corner towers were integrated in the composition. The various concentric platforms symbolize the mountain ranges surrounding the human universe, encompassed in turn by the primordial ocean, here represented by the wide moat skirting the city.

Meanwhile, there was appreciable technological progress: as a result of the general adoption of masonry for temple architecture, the sanctuaries built of brick and hewn stone, to provide the eternal gods with imperishable materials, were soon topped by roofs where wooden timbers and tiles were replaced by corbelled vaulting built of sandstone.

Lastly, the classical period paid special attention to the perfection of ornamental detail. The use of hewn stone contributed to the quality of the sculpture. One of the first really classical buildings in this sense is the small temple of Banteay Srei, some twenty kilometres north of Angkor.

The layout of this jewel in stone is highly original, as it is not a temple-mountain, but a horizontal temple, where the successive closes represent a horizontal version of the superposed galleries typical of the pyramid form.

But the fame of this miniature sanctuary is founded on its extraordinarily rich and elaborate decoration. Despite a certain leaning toward "prettiness" it reveals such authority in its excellence, such a marked feeling for grace and elegance, such a sure hand and such perfect mastery that it undeniably represents one of the highest peaks of Khmer artistry.

The little temple, built in 967 A.D., is completely covered with divinities, nymphs and guardians, beautifully carved in the pink sandstone. The surface shows not an inch of stone which is not decorated with matchless craft, reminiscent in its luxuriance of the primeval forest around it.

In the great temple of Angkor Wat,

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MASTERPIECE OF TOWN-PLANNING *(Continued)*

constructed during the reign of Suryavarman II (1113-1150), the most renowned and glorious of the Angkorian kings, Khmer architecture reached its culmination, both in perfection of form and spacing and in quality of craftsmanship.

The temple proper is a veritable cathedral of the jungle. Paradoxically enough, it is a contemporary of the great gothic structures of Chartres, Sens or Notre-Dame de Paris. Angkor Wat is not only the largest, but also the finest of all the temples erected in the Indo-Chinese peninsula.

The moat, nearly 200 metres wide, lines a rectangle measuring 1,500 by 1,300 metres, and encloses an area of 2 sq. km. larger than such a town as Timgad under the Roman empire. The temple forms the pivot of an urban system of which only the buildings constructed with durable materials have survived, but which must have housed a population of some 17,000 to 20,000 people.

The moat, measuring 5½ km. round, is bridged on the west by a dyke supporting a causeway leading to an immense portico 235 metres long, pierced by three gateways. This spacious structure forming the main entrance prefigures the temple façade, which comes into sight on the far side of these majestic propylaea.

Another axial avenue 350 metres long leads to the foot of the temple proper, its façade rising from a high, elaborately moulded sub-structure, dominated by the five towers crowned by a tiara-shaped stone roof. The colonnaded wings of the immense surrounding gallery, measuring 187 by 215 metres, form a perfectly balanced composition.

Along the inner walls of this gallery runs a fantastic sequence of bas-reliefs girdling the whole temple, which represents a distance of over 500 metres. They constitute a sort of chronicle of the rulers of Angkor, combined with a pictorial mythology.

Passing through the gateway, the visitor enters the cruciform courtyard found at the centre of all classical Angkorian architecture. It consists of four small courts connected by covered corridors and linking the friezed gallery to the gallery encircling the second precinct.

The cruciform courtyard provides the first example of sandstone vaulting supported by four rows of pillars to form a central nave flanked by two aisles. It is a graceful, airy composition, decorated in high relief by a dancing procession of *Devata* and *Apsara* (Indian goddesses).

To proceed to the upper storey, the three parallel galleries in the courtyard follow the rise of the covered stairways by an arrangement of superposed overlapping arches. The gallery running round the second storey opens inwards only, through balustraded windows. This second precinct, measuring 100×115 metres, encloses the enormous base of the temple 13 metres high, topped by the five towers of the sanctuary.

The third tier of the temple-mountain is also formed by an encircling gallery, but its balustraded windows open outwards, while pillared porticos look on to the inner patios. The central shrine, on a level with the four corner towers, is connected with the gallery by covered cloisters, as in the cruciform courtyard. Resting on four projecting porches, it soars a sheer 42 metres upwards to its summit 65 metres above the level of the plain. From that height the gigantic mandala described by the whole complex struc-

Photos © Henri Stierlin, Geneva

JEWEL-TEMPLE AND TEMPLE-MOUNTAIN. Left, the "mandapa", or ante-chamber preceding the sanctuary, of the temple of Banteay Srei. This jewel of a temple set in the forest some 20 miles from Angkor, is watched over by mythical guardians; genies with the bodies of humans flank the stairway leading to the pavilion, while men with the heads of monkeys stand sentinel over the richly-carved entrance to the pink sandstone building. Above, an aerial view of the ruins of Phnom Bakheng, a temple-mountain with 109 towers built on a natural hill situated between Angkor Thom and Angkor Wat. The temple stood 13 metres high atop five rows of terracing. It was surrounded by sandstone towers, arranged in a quincunx, of which only the ruins to be seen on the fifth terrace remain.

ture can be clearly perceived, planned in the image of the celestial palace which is the home of the gods.

Upon the death of Suryavarman II, about 1150, the Khmers' neighbours, the Chams, took advantage of the general disorganization of the empire, then plunged in palace revolutions and struggles for the throne, to carry out a daring raid against Angkor, which they destroyed by fire in 1177. The merit of restoring the Khmer power belongs to King Jayavarman VII; he succeeded in expelling the invaders, and was crowned King of Angkor in 1181, when he at once undertook the total reconstruction of the city.

Jayavarman forsook the Hindu religion of his predecessors and was converted to Buddhism. An entirely new style of building suddenly sprang up, redolent of an oddly fascinating baroque, which superseded the classic formalism of Angkor Wat by a new conception of space and volume: a new art flowered where no line was drawn between sculpture and architecture.

The towers of the temples were carved with colossal faces in relief, representing both the image of Buddha Sakyamuni (Gautama the Sage), and the effigy of Jayavarman VII. There was thus a complete upheaval in both religion and its outward forms.

The King first erected the temple-city of Ta Prohm, which covered an area of 1,000 by 600 metres. The temple proper was built on a plan which was to serve as a model for most of the Buddhist monasteries constructed in Jayavarman's reign. The fundamental conception was that of the horizontal temple already applied at Banteay Srei, but the precincts were enclosed with concentric peripheral galleries as well as walls.

Thus, the progressive encroachment of the surrounding galleries on the steps of the temple-pyramid was completed, while the symbolism remained the same in the horizontal temple as in the temple-mountain.

The layout of the Preah Khan temple, encompassed by a moat 40 metres wide and covering an area of about 1,000 by 750 metres, closely resembled that of Ta Prohm; but both these structures were hurriedly and perfunctorily built, the construction often being of mediocre standard, the adornment crude and lifeless. All the buildings put up in Jayavarman VII's reign show signs of haste.

The capital named Angkor Thom (or "Great Royal City"), built about 1200 A.D., initiated a new trend in Angkorian architecture. It marked the formation of the specific language of the baroque-type art which preceded the decadence of the Khmer empire.

The precinct of the new capital at once introduced a new style; the five dykes crossing the moat supported a fascinating innovation: the Giant's Causeway. This is an approach bordered on either hand by high balustrades formed by 54 giants bearing in their mighty arms the body of an enormous *Naga* (a mythical Indian snake).

This vast allegorical composition symbolizes a theme dear to Indian mythology: the Churning of the Sea of Milk, which represents the creation of the world. Overlooking this mythical scene, at the gateway to the city, stand towers carved with a four-fold effigy, representing the imposing image of the Buddha-King, the ruler of the world, whose regard embraces the four points of the compass.

All this symbolic art culminates in the extraordinary structure of the Bayon, Jayavarman VII's major

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Below, the arresting "towers with faces" of the Bayon temple, miracles of 12th and 13th century monumental art, situated within the Angkor Thom complex. This is what the French writer Pierre Loti wrote after visiting Angkor in 1901: "From on high, the four faces on each tower looked out towards the four points of the compass, beneath lowered eyelids, with identical expressions, each wearing the same smile. They affirmed and reiterated with obsessive power the all-pervading presence of God at Angkor."

Photo © Luc Ionesco, Paris

THE KHMER SMILE OF THE BAYON

by Philippe Stern

WHAT a strange yet wonderful monument we have in the Bayon at Angkor.

The Bayon is the last of the great Khmer monuments in stone. Khmer art began in the 6th century A.D. on territory very roughly corresponding to the Cambodia of today; but during about the first half of its evolution, its monuments, which frequently contained very beautiful statues and were remarkable for their decoration (especially on the lintels), were only small buildings made up of separate elements.

It was not till later, after the foundation of Angkor in the late 9th or early 10th century A.D., that large temples began to appear, with concentric enclosures, and constructed in stone instead of brick.

At Angkor, some thirty monuments were still standing until very recently and, apart from a brief period in the 10th century, Angkor remained a capital until the decline of the splendour of the Khmers with Jayavarman VII—and even for some time thereafter.

At the Bayon two outstanding points of interest compel our attention. One is the outer gallery which, though in ruins, still has intact walls covered with bas-reliefs. From one point in their development, the great Khmer temples were generally made up of concentric galleries encircling a central sanctuary, and from the 12th century A.D. onwards, the outer galleries were covered with bas-reliefs, such as those seen at Angkor Wat, Banteay Chmar and the Bayon.

At the Bayon we find an interesting innovation on the bas-reliefs. Along the base of one of them a series of little scenes of daily life unfolds before our eyes. (Photos pages 30-38.)

These bas-reliefs give us a remarkable insight into the crafts and occupations and the homely details of the life of the people of the time. Khmer art is a religious art, and these scenes are remarkable, not only in themselves, but because nowhere else in Khmer architecture are similar works of a non-religious nature to be found.

But far more striking is the upper part of the monument. The Bayon is a "temple-mountain" of the type usually constructed by each of the great Khmer kings in the form of a tiered pyramid. The temple-mountain was considered to be the centre of the world of men just as the divine mountain was the centre of the world of the gods.

The tower-sanctuaries of the Bayon are striking in that on each of their four sides there is a gigantic face representing the divinity and the deified king merged into one, with all the faces irradiating royal benevolence to the four points of the compass, "looking everywhere", as the texts say.

This was an innovation of the great Buddhist king Jayavarman VII (who reigned from approximately 1181 to 1219 A.D.), which corresponded to his major religious reform undertaken, according to my findings (1), some ten years after his reign began. Since there are more than fifty of these towers, the Bayon constitutes a most extraordinary architectural and sculptural complex.

During the construction of the upper part of the Bayon it was decided to enlarge the building as originally planned. As a result earlier sculptures were hidden and the general effect was one of near chaos. Yet on reaching the upper section the visitor is stupefied by the astounding sight it offers from every viewpoint. He is greeted on all sides and from every height and angle by faces which echo and reflect each other. And many of these faces are smiling.

Later Buddhism, or *mahayana* (Buddhism of the Great Vehicle), differed markedly from early Buddhism. And the Buddhist smile, found on the later statues such as those at the Bayon, is the height of perfection and beauty. (Photos, cover and page 17.) Here the face is shown carved with closed eyes.

What does this smile really mean? For me it is a concrete example of the notion—basic to our aesthetic conceptions—which, when expressed in words, could be translated as a union of opposites, but which, in reality, are opposites that have not yet emerged as distinct entities. In other words a notion which transcends language and concepts.

The closed eyes thus express an inwardness, set apart from everyday things, the search in one's innermost depths for a transcendental detachment and a supra-human peace, the way to *nirvana;* whereas the smile, rising also from the innermost depths, represents the almost tender Buddhist charity of communication and communion with all creatures, imparted by the smiling expression to the face as a whole.

The style at the Bayon thus has a unity of expression which is that of the masculine *bodhisattvas* (heads surmounted by a cylinder with a small statuette) or the corresponding feminine *prajnaparamita* (where the statuette is placed on a cone above the head. (Photo page 16.)

The *bodhisattvas* of the Great Vehicle are the miraculous, almost divine beings who, after countless lives of detachment and charity (perhaps also of cognition) have succeeded in transmigrating to the very threshold of *nirvana*, where they could be freed from all suffering by losing their individuality and merging into the Ineffable, which no words can adequately describe. But they refuse to be set free, in order to devote themselves compassionately to the salvation of others, and until such time as all

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PHILIPPE STERN, *of France, is one of the great names connected with the study of Khmer art. He is the originator of a now widely adopted research method which enabled him to explain the evolution and establish the chronology of Khmer art. His book "Les Monuments Khmers du Style du Bayon et Jayavarman VII" is an internationally accepted source book for scholars. At present he is working on a book on aesthetics the central theme of which, "the smile", is discussed in the article published here. Another of Philippe Stern's works is currently in press: "Colonnes Indiennes d'Ajanta et d'Ellora: Evolution et Répercussions" (Publications du Musée Guimet, Presses Universitaires de France). Honorary curator-in-chief of the Musées de France (Arts Asiatiques), he contributed greatly to the development and renovation of the Musée Guimet of Paris, which is famous for its Oriental collections. Philippe Stern was also one of the first scholars to take a serious interest in the music of Asia and Africa. For his various books on Angkor see bibliography page 42.*

(1) See my book "Les Monuments khmers du style du Bayon et Jayavarman VII", published by Presses Universitaires de France, which contains translations and quotations from philological studies by G. Coedès and other writers on the great historical figure Jayavarman VII.

THE SMILE OF DEEP CONTEMPLATION

Few Eastern forms of artistic expression surpass in beauty the deep smile of the statues of Angkor (right, a deified queen or princess; centre, King Jayavarman VII). Compare this smile with the ghost of a smile on the lips of the pharaoh and religious reformer, Amenophis IV or Akhenaton (extreme right) who reigned in Egypt during the 14th century B.C. It reveals a world of humanity and sweet serenity which was expressed to perfection in Khmer art. The smile shines out from the vast countenances of the "towers with faces" at the Bayon, signifying the benevolent contemplation of the Buddha encompassing the whole universe. (Below, aerial view of the Bayon.)

Photo © Bulloz - Musée Guimet, Paris

Photo © Henri Stierlin, Geneva

THE KHMER SMILE *(Continued)*

men shall be saved along with them.

Jayavarman VII was so strongly imbued with this Buddhist charity that the stele inscriptions near the hospitals (see below) bear the words *"He suffered from the ills of his subjects more than from his own: for it is the grief of the people that causes the grief of kings, and not their own grief"*.

In the Khmer heads of this period (Photos opposite) the closed eyes and the lips drawn out in a deep smile draw us irresistibly into an inner world of surpassing peace and tender compassion for all creatures.

I have in my possession a cast of one of the finest of the heads with this expression. Even though I see it every day, it is an unceasing and inexhaustible source of inspiration to me, as are all forms of beauty which have attained their greatest depth.

I referred earlier to deified kings. But except in the case of Jayavarman VII, at the end of the period of Khmer splendour, what the statue represents is the divinity portrayed according to the contemporary canons of beauty, completely idealized and devoid of any individual resemblance (this is perhaps where its value lies). This is true whether the statues are Hindu (the supreme gods Siva or Vishnu) or Buddhist. Only the inscription indicates that particular human beings (to begin with, only kings, then gradually members of the royal family and even high dignitaries) were considered after death to have been merged into the divine, the deity represented by the statue. It is with Jayavarman VII, presumably identified with Buddha himself (the "Enlightened") that we first see the expression of spirituality combined with the portrait of the individual. (Photos cover and page 17).

This brings to our attention a curious and moving fact. The representations of the "deep smile" are very rare in the history of art (to my belief there are only four periods). The reigns of two great kings who were also religious reformers, Amenophis IV-Akhenaton of ancient Egypt (14th century B.C.) and the Khmer king Jayavarman VII (late 12th and early 13th centuries A.D.), both coincide with such a period (Photos page 17). It is certainly not by chance, for the smile is linked with communication, understanding communion, compassion and even tenderness.

A still more astonishing coincidence is the fact that in both cases, heads of statues representing spiritualized portraits have come down to us. The colossal head of Amenophis IV, at Karnak, reveals one of the most extraordinary faces found on a work of sculpture, with its elongated profile, high cheekbones and long chin.

The head of Jayavarman VII, on the other hand, though also extremely individualized so that one can immediately recognize it in other portraits of the king, is broad-featured and slightly puffed up. Nevertheless it retains all its spirituality (G. Coedès has proved that the portrait is indeed that of Jayavarman VII).

In Egypt, Amenophis IV, who took the name of Akhenaton at El Amarna, was perhaps the first monotheist ruler, and his hymn to the sun is compared in Daniel Rops' "Le Roi ivre de Dieu" with the biblical psalm 104, with which it is identical, verse for verse. In view of the approximate date of the Exodus and the possibly legendary history of Moses, this in all likelihood indicates the influence of Akhenaton on the Bible.

Jayavarman VII showed throughout his life the intense charity of Buddhism ("the grief of the people causes the grief of kings" is only one of many apposite quotations), and was, as we shall see in a moment, a great religious reformer. At El Amarna there is also the feeling for family life, emphasized by Boisselier, in the same way as in the bas-reliefs of the Bayon to which we have already referred (Photos pages 30-38).

Thus a comparison may be drawn between Amenophis IV and Jayavarman VII for their leaning towards the same kind of humanism; but there is no possibility of the one having influenced the other, separated as they

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Photo © R. Cauchetier, Paris - National Museum Phnom Penh

Photo © Giraudon, Paris - Cairo Museum

were by geography and above all by 25 centuries of history.

Another striking particularity of Jayavarman VII is that he appears to have built up a highly complex and statistically-minded civil service. With astonishing accuracy, he indicates almost to a man the number of temple staff and the objects attributed to the temples. Thus there is a record of how many tower-sanctuaries there are to each monument, how many dwellings (probably sections of galleries), the length of the enclosing walls and of the moats that flanked them.

The Bayon was not only the royal temple of Jayavarman VII, perhaps intended as his tomb (the two were frequently combined), but also a pantheon containing statues of many of the gods of the kingdom; though not all apparently, since we know from inscriptions that there were 24,400 of them. There were 8,176 villages dedicated to the temples and 208,532 men and women, including 1,622 dancing girls.

One example of Jayavarman VII's attention to minute detail is the hospitals. His Buddhist charity had its practical aspect, and at intervals along the roads he had resting-places ("houses with hearths") erected, 121 of which were in existence 10 years after he acceded to the throne; also hospitals, 102 of which were already in operation five years after his accession.

The specifications for each hospital were meticulously precise. "All four castes may be treated here. There are two doctors, each having one male and two female assistants entitled to free accommodation, two storekeepers responsible for the distribution of medicaments... two cooks entitled to free fuel and water, responsible for removing dead flowers and cleaning the temple (a chapel annexed to the hospitals)... fourteen hospital attendants responsible for administering the medicaments... two women to pound rice... a total staff of 32, 98 if one includes those who pay for their own accommodation." The various lists are never-ending.

It is not possible to list all the numerous symbolic elements linked to Jayavarman VII's major religious reform, such as the corner decorations, apparently of cosmic significance, in which the lion is placed above the elephant and the *garuda*, a fabulous bird, above the lion.

To take only the specific example of the Bayon, there is the multiplication of the tower-sanctuaries with faces, as we have seen. Another of Jayavarman VII's innovations were the stone town walls, several miles long, which like those at Bayon have gates at the four points of the compass, together with a fifth leading to the royal palace. The gates are surmounted by similar faces, and in front of them, flanking the causeway, are the minor gods *(deva)* and their enemies

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COLOUR PAGES

SUPPLICATION TO THE GODS (page 19)
This 17th century wood carving, measuring three feet in height, once embellished the temple of Angkor Wat. It has now been transported to the Phnom Penh National Museum and packed away for safe-keeping. Hands joined, this worshipper seems to be praying that the sacred temples of Angkor be preserved from their present dangers.

Photo © Luc Ionesco, Paris

ANGKOR WAT (page 20)
The fairy-tale splendour of the temple-mountain of Angkor Wat, with its five towers in the form of a quincunx, mirrored in the waters of the artificial lake which surrounds it.

Photo © Mac Riboud - Magnum, Paris

DANCE OF ETERNAL YOUTH (page 21)
Two joyous nymphs from a relief in the inner courtyard at Angkor Wat. Philippe Stern says that the posture with the hand round the waist indicates an early period in the ornamental style of Angkor. Nymphs from Khmer mythology are called "apsara" or "devata", but the distinction between them is not clear. It has become customary to call dancing nymphs "apsara" and those in an immobile pose "devata."

Photo © Henri Stierlin, Geneva

FACE-TOWERS OF THE BAYON (pages 22-23)
Tele-photo view of one of the awe-inspiring face-towers of the temple of Bayon.

Photo © Bruno Barbey - Magnum, Paris

Photo © Henri Stierlin Geneva

THE FIG-TREE OF THE RUINS (pages 24-25)

Photo © Luc Ionesco Réalités, Paris

"The fig-tree of the ruins reigns supreme at Angkor," wrote Pierre Loti 70 years ago in "Un Pélerin d'Angkor." The botanical name of this tree is "ficus religiosa or indica." "At first no more than a tiny seed," said Pierre Loti, "carried by the wind to a frieze or the top of a tower, its fine, tentacular roots snaked down between the stones... reaching the soil, the roots swelled, dislocating stones and splitting thick walls from top to bottom. The building was then irretrievably lost." Left, one of the four faces carved on the tower of Ta Som gripped in a stranglehold by the "fig-tree of the ruins" (see also the "Unesco Courier," January, 1965, "Monuments in Peril"). Right, the temple of Ta Prohm, in its "natural," untouched state, bears witness to the destructive power of the jungle.

FEMININE FASHION GUIDE (page 26)
Fragment of a bas-relief from the inner gallery of the Bayon temple. The varying tones of pink of the sandstone enhance the charm of several "devata" or "apsara" depicted in a variety of delightful poses. It was the hair-styles, clothing and jewellery typical of successive periods that helped and guided Philippe Stern in establishing the chronology of the different ornamental styles of the Bayon (see also pages 2, 11 and 21).

Photo © Luc Ionesco - Réalités, Paris

Notes of a 13th century Chinese diplomat in Cambodia

by Chou Ta-kuan

Member of a Chinese embassy sent to Cambodia in 1296 on a mission lasting almost a year, Chou Ta-kuan wrote the only eye-witness account known to exist of the Khmer kingdom at the height of its splendour. His invaluable "Notes on the Customs of Cambodia" became famous in China. It was an excellent piece of reporting, full of life and acutely-observed detail, as may be judged from the extracts below. It was not until 1902 that Chou Ta-kuan's Notes were translated in full by the eminent French Oriental scholar Paul Pelliot. These extracts are taken from J. Gilman d'Arcy Paul's translation of Pelliot's version in French, published by the Social Science Association Press, Bangkok in 1967.

TO the Chinese the country called Cambodia is known as Ch'en-la or Ch'an-la and to its inhabitants as Kan-po-chih (Kam boja). The present dynasty, drawing on Tibetan religious lore, calls the country Kan-p'u-chih, a name phonetically allied to Kan-po-chih.

The Royal Palace, as well as official buildings and homes of the nobles, all face to the east. The Royal Palace stands to the north of the Golden Tower and the Bridge of Gold. In the chamber where the Sovereign attends to affairs of state, there is a golden window, with mirrors disposed on square columns to the right and left of the window, forty or so in number. Below the window is a frieze of elephants.

Every man or woman, from the Sovereign down, knots the hair and leaves the shoulders bare. Round the waist they wear a small strip of cloth, over which a larger piece is drawn when they leave their houses. Many rules, based on rank, govern the choice of materials.

Only the ruler may wear fabrics woven in an all-over pattern. On his head he carries a diadem much like those worn by the *vajradhara;* at times he lays aside the diadem and weaves into his hair a garland of fragrant blossoms reminding one of jasmine.

Only the womenfolk of the commoners are permitted to stain the soles of their feet and the palms of their hands. This is forbidden to men. The wearing of fabrics patterned with recurring groups of flowers is permitted to high officers and princes. Ordinary mandarins are allowed to wear only material with two groups of flowers, and women of the people may do likewise. Should a Chinese, newly arrived, wear cloth with two groups of flowers, it cannot be charged against him, for he is "An-ting pa-sha", "a man who does not know the rules."

When functionaries go out in public, their insignia and the number of their attendants are regulated according to rank. The highest dignitaries use palanquins with golden shafts and four parasols with handles of gold; those next in rank have a palanquin with golden shafts and two gold-handled parasols; then come those entitled to one palanquin with gold shafts and one gold-handled parasol; and finally those with only a gold-handled parasol. Further down the line come those permitted only a silver-handled parasol.

For ordinary correspondence, as well as official documents, deer-skin or similar parchment is used, which is dyed black. The parchment is cut by the scribe in sizes to suit his needs. A sort of powder resembling Chinese chalk is moulded into small sticks called *so*, which are used to inscribe the parchment with lasting characters. When finished with writing, they place the *so* behind the ear. The nature of the characters makes it possible to recognize the writer. Rubbed with something moist, they disappear. All documents are read from left to right, and not from above to below.

In Cambodia the New Year begins with the tenth Chinese moon, and is called *chia-te.* In front of the royal palace a great platform is erected, sufficient to hold more than a thousand persons, and decorated from end to end with lanterns and flowers. Opposite this, some hundred and twenty feet distant, rises a lofty scaffold, put together of light pieces of wood, shaped like the scaffolds used in building stupas, and towering to a height of one hundred and twenty feet. Every night from three to six of these structures arise. Rockets and fire-crackers are placed on top of these —all this at great expense to the provinces and the noble families. As night comes on, the King is besought to take part in the spectacle. The rockets are fired, and the crackers touched off. The rockets can be seen at a distance of thirteen kilometres: the fire-crackers, large as swivel-guns, shake the whole city with their explosions.

Every month a festival is held. The fourth month they have ball games. With the ninth month comes the *ya-lieh* or census, when the entire population of the kingdom is summoned to the capital and passed in review before the royal palace. With the fifth month comes the ceremony of "bringing water to the Buddhas." Then Buddhas are carried from all over the kingdom, water is procured, and the ruler lends a hand in cleansing them. The festival of floats marks the sixth month, with the King enthroned on a belvedere to enjoy the spectacle.

"The burning of the rice" marks the seventh month. This is the season for harvesting the new rice, which is brought to the South Gate and burned as a sacrifice to the Buddha. Countless women arrive in carts or on elephants to watch this ceremony, but the ruler is not to be seen. The eighth is the month of *ai-lan,* or dancing. Every day actors and musicians are summoned to the royal palace to perform the *ai-lan.* In addition battles are staged between boars and elephants. Foreign ambassadors are invited as guests of the King to these festivities, which last ten days.

Every day the King holds two audiences for consideration of affairs of state. No list of agenda is provided. Functionaries and ordinary people who wish to see the Sovereign seat themselves on the ground to await his arrival. In the course of time distant music is heard in the palace, while from outside blasts on conch-shells sound forth as though to welcome the ruler. I have been told that at this point the Sovereign, coming from nearby, contents himself with only one golden palanquin. Two girls of the palace lift up the curtain with their slender fingers and the King, sword in hand, appears standing in the golden window. All present —ministers and commoners—join their hands and touch the earth with their foreheads, lifting up their heads only when the sound of conchs has ceased. The Sovereign seats himself at once on a lion's skin, which is an hereditary royal treasure. When the affairs of state have been dealt with the King turns back to the palace, the two girls let fall the curtain, and everyone rises. ■

100 YEARS OF EFFORT

by Madeleine Giteau

ACCEDING to the throne of Angkor after having overthrown a Thai prince imposed by the Siamese sovereign, Ponhea Yat, the king of the Khmers, decided to abandon his prestigious capital, prefering to establish himself on the banks of the Mekong, first at Srei Santhor, then at Phnom Penh.

According to generally accepted chronology, Ponhea Yat is supposed to have abandoned Angkor around 1432. But in a recent study O.W. Wolters fixes his accession to the throne at an earlier date and, consequently, holds that Angkor was abandoned around the year 1400. Wolters believes that Ponhea Yat may well have merely confirmed a change in residence which his predecessors had already carried out provisionally.

Whatever the date, its causes remain the same. Situated close to the frontier and renowned for its splendour, Angkor was a much coveted and easily accessible prize and King Ponhea Yat understood this well.

Abandoned by the monarchy, frequently occupied and pillaged, its sanctuaries mutilated and the cream of its population departed, the city was soon invaded by forest.

Although Henri Mouhot is generally accorded the title of "discoverer of Angkor", he is far from being the first to have found the city which was in fact never really lost. It was a sixteenth-century Khmer king who first "discovered" it. In the course of a hunting expedition, he came across this extraordinary city in the middle of the forest, which his predecessors had abandoned less than a century earlier.

The Portuguese, Diego do Couto, relates the circumstances of this discovery: "Around the year 1550 or 1551, the King of Cambodia was hunting elephants in the most dense forest areas of the kingdom, as was his habit. His people, cutting through the brush, came upon some imposing constructions invaded by luxuriant undergrowth which they were unable to penetrate.

"And this being told to the king, he went to the site and, seeing the extent and height of the exterior walls, wanted to see the interior as well. Immediately he gave orders that all the undergrowth be cut and burnt... And, after everything had been carefully cleaned, the king entered within. After examining the whole site, the king was struck with admiration by the extent of the constructions. For this reason, he straightway decided to move his court there" (1).

It was thus that, in the 16th century, the monarchy returned to Angkor. All the same, the date suggested by Diego do Couto seems a little late; inscriptions on the later bas-reliefs at Angkor Wat tell us that these sculptures were begun, on the king's orders, in 1546. It is probable that the sculpting of the later bas-reliefs at Angkor Wat is related to the return of the monarchy to the region. This return, then, probably took place around the beginning of the second quarter of the 16th century, at the latest.

The king of Cambodia at that time was Ang Chan, a brilliant sovereign who, for a few years, restored the lustre of the Khmer monarchy. After his death, the kings of Cambodia continued, for a while, to reside at Angkor.

Portuguese and Spanish missionaries then arriving in Cambodia were able to see Angkor and their marvelling accounts are to be found in contemporary works.

The capital, however, remained at Lovek, to the south-east of the Great Lake. In 1593, the Thais captured Lovek, Satha fled to Laos and the monarchy, which fell back on Srei Santhor, was beset by war and usurpation.

Although their residence was at Srei Santhor, or at Oudong, the Cambodian kings continued to visit Angkor. Throughout the 17th century, sovereigns made pilgrimages to this shrine, which had witnessed the great days of their dynasty. The chronicles mention these journeys, and the events which marked them.

At the end of the 17th century, the monarchy abandoned Angkor for good. In the 18th century, the Thais and Vietnamese exercised increasing pressure on Cambodia, so there was no question of the kings either going to Angkor or ensuring its upkeep. Little by little the undergrowth crept back into Angkor Thom, though Angkor Wat remained a cult shrine.

From the 16th century to our own times successive new religious foundations were made and the site attracted Khmer pilgrims and foreign visitors. Evidence of this lies in the accumulated statues in the galleries and in the Cruciform Courtyard and in the inscriptions translated by Etienne Aymonier. In wood or in stone, in princely or monastic attire, the buddhist images of Angkor Wat illustrate every school of sculpture that has flourished in the post-Angkorian period.

Texts published throughout the 17th and 18th centuries prove that the ruins of Angkor remained famous. In 1676, a Spanish historian, the Dominican Navarrete, reported that, in Cambodia, "There are magnificent monuments and decoration more perfect than one can say"; he recounts a frequently formulated theory according to which Alexander the Great "built this most sumptuous of monuments, enclosed within its courtyards and cloisters". At the beginning of the 17th century, a Japanese pilgrim, who had come to Cambodia, drew up a plan of Angkor Wat, of which a copy was made in 1715.

FOLLOWING the Portuguese and the Spanish, the French came to hear of Angkor. In 1668, in the course of a stay in Cambodia, Father Chevreul mentions Angkor, and emphasizes the fame of this holy place throughout south-east Asia.

At the end of the 18th century, Father Langenois, who had been sent as a missionary to Battambang, visited Angkor of which he gave a short description in latin, a description which was later made use of by Father Bouillevaux. Father Langenois recounts, in a letter, the visit of the Portuguese missionary, Father Carpo de Orta, and describes a typical sculpture which must have been a representation of the ascetic Sumedha, an incarnation of the Buddha in a former life.

Thus, at the end of the 18th century, thanks to travellers both from the West and from the Far East, the existence of Angkor, the fine layout of its buildings, the richness of its decorations and even certain of its sculptures were known. These accounts however, were only known to a restricted public, since they often remained stored in the archives of monastic orders.

If we cannot accord to 19th century travellers the glory of having discovered Angkor, at least they have the merit of having revealed the celebrated dead city to the public at large. In 1858, Father Bouillevaux published a description of Angkor, which he had visited in 1850. Bouillevaux was subsequently to contest the title of "discoverer of Angkor" with Henri Mouhot. But Bouillevaux had not really discovered Angkor, and the

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MADELEINE GITEAU *Is a French Oriental scholar and member of the Ecole Française d'Extrême-Orient on whose behalf she has undertaken a number of missions to South-East Asia. Former curator of the National Museum of Phnom Penh, she was commissioned by Unesco to study and catalogue the collections of the Wat Phra Keo Museum of Vientiane, Laos. She is the author of several works on Khmer civilization and Asian art (see bibliography page 42).*

(1) Quoted from "Angkor et le Cambodge au 16e siècle d'après les sources portugaises et espagnoles", by Bernard Groslier and C.R. Boxer, Paris 1958.

forgotten city cleared from the jungle

profound beauties of Khmer art quite clearly utterly escaped him.

This was not the case with the naturalist Mouhot, who visited Angkor in 1860. He died shortly after, but his notes were published after his death. If not the "discoverer of Angkor", at least he appreciated the extraordinary artistic value of these ruins. He imparted his enthusiasm to the readers of a variety of publications, including the mass-circulation "Tour du Monde", and from then on visitors to Angkor began to increase in numbers.

A permanent Mission to Indochina, later to become the Ecole Française de l'Extrême Orient, was founded on December 15th, 1898, under the patronage of the Academie des Inscriptions et Belles lettres. Its aim was to study not only the monuments, but also the history, the languages and the civilizations of south-east Asia and neighbouring countries. When the treaty of 1907, concluded with Siam, returned the province of Siem Reap to Cambodia, the Conservation d'Angkor was set up to clear and restore the monuments.

From its foundation, the Conservation was entrusted to J. Commaille. When, in 1916, Commaille was murdered by pirates while delivering the workmen's pay, his place was taken by H. Marchal who remained there till 1932. H. Marchal was subsequently to return to the Conservation twice: in 1935, and, in 1947, in order to restore the South Gallery at Angkor Wat. Since 1960 the Conservation has been directed by B. Groslier.

Commaille's first task was to open up the monuments, to clear away the forest which had engulfed them, keep the ever threatening undergrowth at bay, remove the accumulated earth and the piled up debris, and prevent their further degradation. Only very simple equipment was available to the first curators. Nonetheless this was sufficient to deal with the most urgent problems.

The most important innovation in the restoration of the temples was the adoption of *anastylosis*, a process which consists in restoring a monument with its own materials and according to the original construction methods.

In 1930, H. Marchal was sent to Java, where archaeologists had already used this method. On his return, Marchal applied the method to the restoration of the temple of Banteay Srei. Anastylosis was subsequently used in the restoration of the greatest monuments, and it has remained the basic process for work carried out since that time.

The piety of the Cambodians, and the establishment of two monasteries within the enclosure had saved Angkor Wat from invasion by the undergrowth; but ground subsidence and the poor state of the stonework had led to widespread decay. Long years of effort have gone into the restoration of Angkor Wat; the tireless work of restoring collapsed elements, of consolidating and reconstructing the galleries has begun; finally research has produced good results in dealing with stone decay.

The Bayon temple was cleared between 1911 and 1913, and anastylosis of the towers with faces was carried out between 1939 and 1946. After 1960, research was undertaken aimed at removing the lichen which covers the stone reliefs, giving the monuments a leprous appearance.

WORK was begun on the Great Palace of Angkor Thom and its approaches in 1911. Bas-reliefs in the interior of the Elephants' Terrace and the Terrace of the Leprous King were discovered at that time.

Just before the events of 1970, excavations had revealed a prolongation of the Terraces to the north of the Terrace of the Leprous King. Close to the Great Palace of Angkor Thom, the Temple of Baphuon, built on an artificial hill of light soil, had been dislocated in ancient times by subsidences. The many attempts to consolidate the monument had brought only temporary relief and so, in 1958, it was decided to reconstruct the temple completely. This considerable undertaking—the base of Baphuon measures 120 m. × 100 metres—was partially carried out in 1970.

Restoration work has been carried out both within the enclosure and in the surroundings of Angkor Thom. Three of the roads, lined by stone giants, which give access to the city, have been restored, each road leading to a monumental gate surmounted by a tower with four faces. The temples of Ta Keo, Ta Prohm, Preah Khan, Banteay Kdei, Ta Nei and many others have been excavated and partially restored. Following the restoration of Banteay Srei, Banteay Samre, Neak Pean and the central sanctuary of Bakong were restored by anastylosis.

While the excavation and the restoration of the temples was going on, researchers were studying the considerable documentation afforded by these monuments.

Those who were beginning to take an interest in Khmer art could linger lovingly over the romantically exotic drawings that illustrated Louis Delaporte's "Voyage to Cambodia" and examine the first photographic documentation in John Thomson's book. Publication of the works of H. Dufour and G. Carpeaux has meant that full details of the bas-reliefs of the Bayon are available to researchers. Carpeaux, the son of the famous French sculptor, was to die at this task.

At the same time Commandant Lunet de la Jonquière produced a "Descriptive Inventory of the Monuments of Cambodia", a basic work still of great value 60 years later. The abstracts and architectural studies of the monuments were primarily the work of Henri Parmentier, head of the Archaeological Department of the Ecole Française d'Extrême Orient. To pinpoint the vestiges of monuments, of successive town walls and the traces of roads and hydraulic works, Victor Goloubev directed an aerial survey lasting from 1931 to 1934. This survey was resumed by Bernard Groslier in 1951.

The sites of Angkor have yielded a large number of inscriptions. Following the work of the German epigraphist Adolf Bastian, the Dutch scholar Hendrik Kern became interested in Khmer epigraphy. He in turn was followed by the German August Barth and the Frenchman Abel Bergaigne who translated the first collection of inscriptions. Finally Georges Coedès published eight volumes of these inscriptions and succeeded in re-constituting the history of Angkorian Cambodia and in bringing to life again great kings who had long been forgotten.

Thus we learnt which kings and dignitaries had constructed temples and the nature of their religious foundations was revealed. Like Bernard Groslier, Laurence Briggs, who published a history of Angkor, followed the fortunes of the city after the removal of the capital to the east. Finally, Jean Filliozat, Director of the Ecole Française d'Extrême Orient, began a study of the temples as seen in Indian texts.

An important step forward in our knowledge of Khmer art was due to Philippe Stern who established the chronological order of the monuments on the basis of the evolution of their decorative motifs.

Now, after a century of research and effort, Angkor is as well known to the general public as to the scholar and the art-lover. ■

12th CENTURY DIARY IN STONE

an extraordinary record of daily life carved on the walls of the Bayon temple

photographs by Luc Ionesco

text by Soubert Son

On the following pages we present a remarkable series of photo-studies of the bas-reliefs of the temple of Bayon made by a French photographer, Luc Ionesco. Ionesco spent five years examining and photographing the monuments at Angkor, often waiting many hours in order to obtain the right shot. The result is an extraordinary testimonial revealing details with a depth and precision rarely attained before. A young Khmer ethnologist, Soubert Son, has written the commentaries on these photos specially for the "Unesco Courier". Mr. Son was born in Phnom Penh and is a former Unesco scholarship-holder for the study of the conservation and restoration of monuments.

Photos © Luc Ionesco, Paris

The walls of the Bayon temple of Angkor bear striking testimony to the exceptional care and interest that King Jayavarman VII took in the joys and sufferings of his people. Towards the end of the 12th century, Jayavarman ordered his sculptors to carve on the outer walls of the Bayon the minutest details of the daily life of his subjects, providing a veritable saga of the humble men and women who had contributed to his empire's greatness.

A profusion of carvings of people, plants and animals unfolds before our eyes like a gigantic strip cartoon, completely covering the 1,300 square metres (approx 14,000 sq. ft.) of the Bayon gallery walls (above, the outer gallery to the south of the temple). The carvings present scenes from the everyday life of the common people, their work, their food, their amusements, etc. The daily life of the Khmers was linked to the rhythm of the two main seasons of the year: the dry season, the time of festivals and leisure activities, and the rainy season, the time of work in the paddy-fields. Here the close link between the temple and the rice crop is clearly evident (see article page 6).

From sunrise to dusk, craftsman, merchant and housewife went about their business. From 6 a.m. to noon the markets were particularly animated with their stalls laden with vegetables, rice, herbs and spices, fish and meat, silks from China, pewter-ware from Chen-chou, porcelain from Ch'uan-chou, fishing tackle, medicines, combs and trinkets and hardware of every kind. (Photo left, detail of a teapot measuring only a few centimetres on the Bayon wall.)

CONTINUED NEXT PAGE

12TH CENTURY DIARY IN STONE *(Continued)*

The Khmer sculptor had a keen eye for the human foibles and idiosyncrasies of his fellow men whom he carved with spontaneous realism and an occasional touch of humour. We can pick out merchants and craftsmen, masons shaping their stone (above right), pedlars selling grilled fish on skewers (above left), cooks busy at their ovens preparing cakes, cooking rice or serving drinks (below). Elsewhere the artist regales us with scenes from the life of the nobility, from military life, of craftsmen sitting down to a communal meal. He shows us landscapes, farmyard scenes, cattle (right, a bull tethered to a tree), as well as amusing incidents such as the youngster pilfering goods from a stall while its owner is taking a short siesta.

CONTINUED PAGE 34

Photos © Luc Ionesco, Paris

12TH CENTURY DIARY IN STONE *(continued from page 32)*

On the following four pages we present a photo-panorama of one of the complete outer walls of the Bayon temple. The bas-reliefs on the inner walls are devoted to religious and court scenes. The outer walls portray scenes from daily life and historical events in Angkor's past. Here the sculptors gave free rein to their narrative talents.

Many of the scenes they depicted were doubtless inspired by the festivities connected with the celebration of the New Year and the Rice and Dance Festivals. Below, an acrobat, lying on his back, manipulates a wheel with his feet, while another actually seems to be performing a juggling act, balancing children on his head and hands. A tightrope-walker sways above the crowds, who watch with open-mouthed admiration. Hunting scenes are frequent, with the hunters attacking game of all kinds with bow and arrow, crossbow and blowpipe. (Photo right, detail of bird perched on a branch).

CONTINUED PAGE 36

Photos © Luc Ionesco, Paris

FIND THE CROCODILE !

Amidst the wealth of plants and animal and human figures in the Bayon bas-relief (above), can you spot the crocodile and fish, captured and magnified by the camera's lens (right)? If not, turn the page and you will see this same detail in its broader fishing scene setting. The three photographs together illustrate the extraordinary carving ability of the Khmer artists and their skill in portraying fine detail as well as the revelatory powers of modern photographic art. The panorama shown on these two pages and the two previous pages represents 26 metres, that is 85 ft. or one tenth of the length of the wall with its bas-reliefs five metres (16½ ft.) high which surrounds the Bayon temple.

Photos ©: Luc Ionesco Paris

12TH CENTURY DIARY IN STONE *(continued from page 34)*

The temples of Angkor Wat were veritable cities within a city and their towers looked out over a huge urban area with its artificial lakes, its palaces, its residential quarter for ambassadors and high dignitaries its jewellers' and weavers' stalls, its painters' and sculptors' studios, its masons' and carpenters' workshops. Beyond lay the rural suburbs where lived the peasants, market-gardeners and fishermen. Thanks to the genius of the Khmer sculptors, many details of their working methods have come down to us across the gulf of eight centuries. For example, a whole sequence of the Bayon bas-reliefs is devoted to fishing which, though practiced all the year round, really came into its own during the dry season, when the amateur angler, freed from his work in the paddy-fields, could devote himself to the sport.

CONTINUED PAGE 38

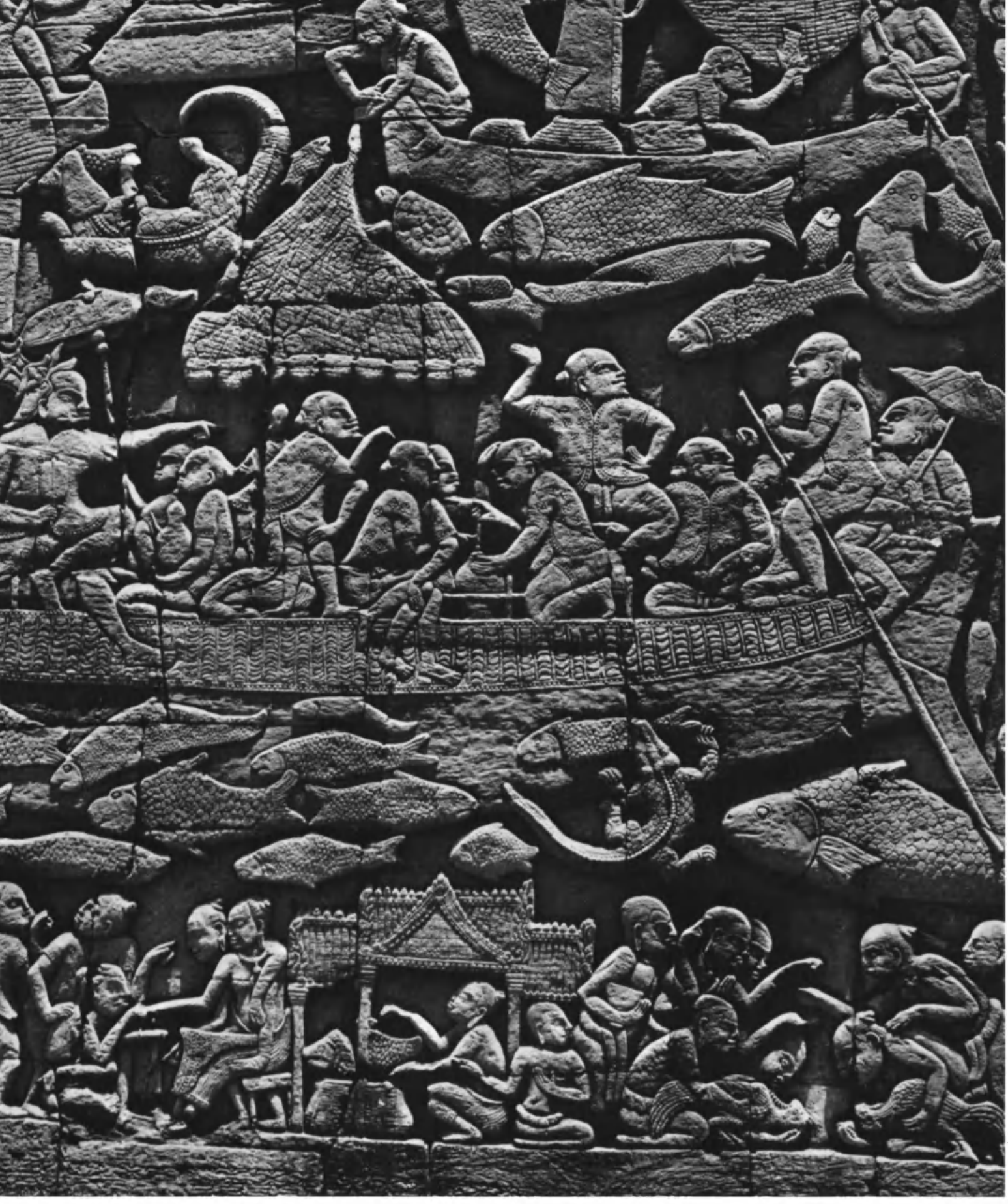

Photo © Luc Ionesco, Paris

12TH CENTURY DIARY IN STONE *(continued from page 36)*

In this scene (top of photo) a fishing-boat makes headway through waters abounding with turtles, crocodiles and fish of all kinds. In the stern is the oarsman, while, in the bows, the fisherman has just cast his net. Between them, a third member of the crew displays his catch. Fishing with nets probably took place on rivers and on the great artificial lakes which the Khmers built. The fishermen's flimsy craft are dwarfed by the big pleasure boats, like the one in the centre of the scene, on which the passengers amuse themselves with all manner of games and dances. The bottom of the frieze depicts a series of common scenes, including (right) a group laying bets on the outcome of a cockfight. These are just a few pages from this history book in stone, vibrant with life, bequeathed to us by Khmer sculptors and artists. ■

THE KHMER SMILE OF THE BAYON (continued from page 18)

(the *asura)* holding out the mythical serpent above the waters of the moats.

According to Paul Mus and to G. Coedès, this is all intended to symbolize the rainbow, linking the world of men to that of the gods, and also the *Churning of the Sea of Milk*, a cosmic myth related to the grandeur of the kings frequently found in Khmer bas-reliefs, in this case sculptured in the round and on a gigantic scale.

The story goes that in one of his incarnations, or *avatars* (the Hindu belief in *avatars* was retained by the Buddhist Jayavarman VII by syncretism between the two religions) the Hindu god Vishnu, in the form of a tortoise, upholds the Sacred Mount while *deva* on one side and *asura* on the other, grasping the mythical serpent, with the Sacred Mount serving as a churn, make many wondrous things gush forth from the Sea of Milk, culminating with the ambrosia of immortality *(amrita).*

Paul Mus suggests that the *deva* at each gate probably have their corresponding *asura* at the gate on the opposite side of the town; and that since the Bayon was situated at the centre of these walls and gates, it was precisely a symbol of the Sacred Mount, used for the Churning of the Sea of Milk on a gigantic scale.

THE fact that the Bayon was considered to be the centre of the town both gave rise to, and later dissipated, a serious error in research. An inscription which is of a late period, but lengthy and detailed, indicates that the king who founded Angkor (Yasovarman) had the royal *linga* or "God-King", the phallic emblem of Siva, erected on the central hill, and since the temple-mountain of the Bayon was at the centre of these stone walls, it was assumed that the Bayon was the first great Khmer monument... when in fact it was the last.

When I began to study the Khmers, this was the key used in dating all the other temples, with the result that the chronological sequence of the monuments of Angkor was the wrong way round.

My whole career as an archaeologist has been based on a method which lays no claim to replace other methods, but merely to complement them. It consists in attempting to establish the chronological order of monuments and of the evolution of types of art, motifs or styles, by making comparisons with the development of a certain number of motifs chosen on the basis of experiments devised for this purpose. When applied to Khmer art, this method proved that the date attributed to the Bayon was impossible and must be considerably later.

I thus had the honour and the good fortune, together possibly with some insight, of proposing a complete change which put research on the right lines. I did not however go far enough in either direction, and it was G. Coedès, on examining the inscriptions after I had published the results of my work, who situated the exact date of the Bayon during the reign of Jayavarman VII. At the same time, the centre of the original town was identified from the air by V. Goloubev as being even more different than I had thought.

The original error, as indicated in my first book, derived from the fact that the Bayon is the centre of an enclosure whose gates are of the same style as the Bayon and accordingly of the same period. Previously, the successive centres of Angkor had been located elsewhere.

Thus the establishment of the entire chronology of the Khmer monuments hinged on the Bayon.

At the close of my career, it was again the Bayon, with the constructions added by Jayavarman VII to monuments built during his own reign to house new gods (this was a time of great enthusiasm for deifying human beings), which enabled me to cross-check the method employed.

To take a single example, the female figures on the walls *(devata* or *apsara)* differed considerably according to whether they belonged to the first, or the third and last period of the style. Where these two different types, indicating the beginning and the end of the style, are to be found side by side on the same gallery in the same monument, there is always between them a vestige on the wall of the architectural addition separating the new part from the older one, providing objective proof of the accuracy with which the development of the motifs has been studied.

This is demonstrated in my book "Les monuments khmers du style du Bayon et Jayavarman VII" which includes the essential parts of the texts concerning Jayavarman VII written by G. Coedès, with whom I collaborated throughout, constantly exchanging archaeological and philological observations. It also contains texts by Paul Mus. To both these scholars, who died recently, I wish to pay particular tribute for their outstanding work.

While the Bayon of Angkor was the temple-mountain of Jayavarman VII, it is only one of a great number of buildings in the same style. Examples are the two great groups of buildings dating from the beginning of his reign (the date was estimated using the method indicated above, and subsequently confirmed by an inscription): the first, Ta Prohm, dedicated by the king to his mother and his *guru*, and the second, still larger, Preah Khan at Angkor, to his father (the head of Ta Som—colour photo page 24— comes from the enclosure added by Jayavarman VII to one of his own, smaller, monuments). But monuments in the Bayon style are very numerous at Angkor and even outside the Angkor complex.

BY far the most remarkable site of all, Angkor itself contains more than 30 temples; but scattered throughout the country there are an enormous number of Khmer monuments, many of which are remarkable and some unique in style. Representative examples of pre-Angkorian Khmer art are the astonishing 7th century group of Sambor Prei Kuk and, perhaps the most perfect Khmer temple of all, the small, delicately detailed, 10th century temple of Banteay Srei. It is a constant source of anxiety to us to think of the dangers to which they are daily exposed, particularly the temples at Angkor and the Phnom Penh museum, with its unique collection of Khmer sculptures, other Khmer temples and the Cham monuments in what is today Viet-Nam. Many difficulties have been surmounted and much patient effort devoted to the reconstruction of seriously dilapidated monuments, some of which have even been restored to their original state, yet a monument, and the work done on it, could be reduced in an instant to a heap of rubble.

These buildings which we have studied for so long have become for us almost like living friends.

We implore those involved in the present hostilities, whatever their convictions, to spare these monuments. Most of them were the work of their ancestors, a valuable treasure house of beauty enriching mankind as a whole, which is entrusted to their care. They are also a tourist attraction from which everyone stands to gain. It is our fervent hope that once peace is restored (which we all hope for, and which must come one day), all these beautiful monuments, all these totally irreplaceable groups of buildings which we love so intensely, will emerge unscathed. ■

Philippe Stern

Letters to the Editor

NEW WMO EMBLEM

Sir,

I have noticed in the August-September 1971 issue of the "Unesco Courier" that you are still using the World Meteorological Organization emblem which was amended by WMO's Fifth Congress in 1967.

F.T. Hannan
Chief, External and Public Affairs Office
World Meteorological Organisation
Geneva

PERILS OF PESTICIDES

Sir,

The article by Gene Gregory in the June 1971 issue of your excellent magazine tells us that:

"... some gifted polemicists, with an emotional, romantic and mystical bent, have effectively managed to persuade many people, including some public officials, that pesticides—especially DDT—are dangerous and should be banned. Contrary to many reports, no one has yet been harmed in any way by residues of crop protection products..."

If this had been written at the end of the last war—shortly after the discovery of DDT—it would have surprised no one. But, published in 1971 in a magazine concerned with modern world affairs, it is, to say the least, a cause for some astonishment.

If the idea of a complete ban on pesticides is absurd, it is no less absurd to maintain that pesticide residues have never harmed anyone in any way. Over the years, numerous examples have shown that the use of pesticides has harmful, often unforeseeable, side effects which sometimes deeply disturb nature's equilibrium. One of the most striking examples is the progressive disappearance of certain species of birds due to a rise in sterility and a drop in the hatching rate—a direct result of the use of pesticides.

Unfortunately, such tangible harmful effects are not confined to animals, but are now being noted in human beings. Certain vegetation defoliants, such as 2-4-5-T, result in genetic malformations and defects, and some organo-mercury fungicides can cause damage to the kidneys and serious disorders of the nervous system.

Many similar examples could be given. Should we then ban the use of these toxic agents? No, since we can use them to control a wide range of destructive pests, disease-carrying insects and parasites of all kinds. To ban them would result in unprecedented disasters to crops and orchards and the re-appearance of illnesses that today have virtually disappeared.

So it is difficult to draw up an accurate balance sheet on the use of pesticides, particularly one that takes into account long-term effects, many of which are still unknown.

Another article published in the August-September 1970 issue of the "Unesco Courier" stated: "Minute amounts of pesticides such as DDT have been found to inhibit photosynthesis in marine algae by 75 per cent. Yet we have dumped an estimated 1,000 million lbs of DDT into our environment and are adding some 100 million lbs per year."

This long-term effect upon photosynthesis is easily the most disquieting factor of all.

What remedies can we adopt? Research is opening up new possibilities of combatting parasites. These solutions include: the development of a rational system of "pest management" in place of the systematic (and often excessive) use of pesticides; the replacement of a purely chemical onslaught by an integrated attack which would include crop rotation and a carefully phased use of pesticides; research into a biological control of pests by the introduction of their natural enemies, the use of hormones to attract or repel pests and sterilization of the males.

Indeed, how much easier it would be if only pesticides were not dangerous!

Jean-Pierre Ribaut
Head of the Division for the Environment and Natural Resources
Council of Europe, Strasbourg

STANDING ROOM ONLY

Sir,

In his article "The Magic of Modern Chemistry" (June 1971) Gene Gregory assures us that chemistry is now supplying and will continue to supply mankind with the food, clothing and other requirements for its continuing life and comfort. Mr. Gregory seems to forget that the population of the world is growing and that the earth's surface is limited; this means that one day there will just be room for all of us if we remain standing packed together side by side. Can Mr. Gregory tell us what chemical processes will make life possible under these conditions? There wouldn't even be room for crops, however well fertilized.

Your author also appears to forget that food, medicine, housing, etc. are not enough, and he slides very rapidly over the problem of pollution and the destruction of the world's beauty spots.

Viviane Nordon
Paris, France

ELECTRONIC HANDS

Sir,

In its April 1971 issue, the "Unesco Courier" published a photo of a "Soviet-developed artificial arm and hand unit,"

MASTERPIECE OF TOWN-PLANNING *(continued from page 13)*

achievement. The Bayon represented an entirely new departure which was rich in significance, as it heralded the irradiation of the Khmer country by the Buddhist faith.

Such is the moving and impressive legacy left by the last of the great Khmer Kings. In his time, architecture broke through its confines, effaced the distinction between building and sculpture, and adopted the rôle of mystic diagram, way of initiation, giving man the key to the universe and the divine world.

During the 14th century, despite the repeated incursions of the war-like Thais from across the border, a few weak kings succeeded each other on the throne of Angkor; but the city was abandoned in the mid-15th century. The vicissitudes of war and the widespread destruction altered the rate of flow in the vast hydraulic installations of the plain of Angkor. The water, which was previously clouded with silt, became limpid, and fostered malaria.

The whole Angkorian mechanism, which had brought wealth, prosperity and power to the Khmers, seemed to fall under an evil spell, and ground to a halt. Fever and malaria compelled the decimated population to desert the immense city, now a useless seat of pestilence. Pollution had brought low a powerful empire.

Any attempt to assess the achievements of the Khmers during their four centuries of flourishing civilization at Angkor should recall that the rice-field and the temple were the two extreme links in the same sequence of events governing the development of the area. Ecology illuminates the forms assumed by art. ■

Henri Stierlin

to illustrate an article entitled "A Soviet Scientist looks at Futurology."

In fact, this photograph was originally taken to illustrate the use of electronic hands and myoelectric devices developed specifically at the Rehabilitation Institute of Montreal, Canada, and particularly to show the various developments that have taken place to improve the original Russian hand prosthesis purchased by the Rehabilitation Institute in 1964.

The original Soviet equipment was modified in several respects. On the basis of clinical experience, all wiring was incorporated in the structure of the forearm socket. The reliability and convenience of the device were improved and the patient's comfort increased. A versatile new battery package utilizing a flexible plastic enclosure was developed.

The Department of Research of the Institute decided to design a new control unit. The principal characteristics of this unit are a very good stability and performance, small dimension and negligible weight and it is easily accommodated between the walls of a laminated plastic arm socket. The unit has been used on approximately 60 patients for the past four years and has proved to be reliable.

The primary purpose of this communication is to indicate that the prosthesis illustrated in your article is not the sole result of the U.S.S.R. efforts. It is the result of improvements and research.

G. Gingras
Executive Director
Rehabilitation Institute of Montreal, Canada

UNESCO'S NATIONAL COMMISSIONS

Sir,

I read with great interest the article by Mr. Wayne McEwing on Unesco in the August/September 1971 issue of the "Unesco Courier" devoted to Unesco's 25th anniversary.

I was much impressed by the survey carried out by this young Canadian and especially by his fresh and lively approach and the sincerity of his remarks.

Nevertheless, I regret that Mr. McEwing said nothing about the role of the National Commissions in Unesco's activities and that consequently the uninformed reader might have the impression that Unesco consists only of a headquarters and Secretariat in Paris, and be unaware of the national branches of Unesco—the National Commissions—which give Unesco a strength and originality in the United Nations family.

One further point, it is generally accepted that it was Copernicus and not Galileo who showed that the earth circled the sun.

Wladyslav Grzedzielski
Secretary-General
Polish National Commission for Unesco
Warsaw

THE 2000 A. D. PROBLEM

Sir,

By the year 2000, 7,000 million people will inhabit the globe, yet Gene Gregory (June 1971) is calmly counting on modern chemistry to solve the problems that this will pose. But if mankind concentrated its efforts on controlling the number of births, none of these problems would arise. If the population could be maintained at a reasonable level, the quality of life would be much higher than it will be with the help of the chemicals with which we are flooded, and which pollute the atmosphere, water and food. Man, after all, is supposed to be an intelligent being? Yet thanks to these "miracle" chemical products, we are slowly but surely destroying the balance of nature, and this may one day threaten the very existence of life on our planet.

E. Jamet
Savigny-sur-Orge, France

SOS ENVIRONMENT

Sir,

We were immensely gratified to find the Menton Statement ("A Message to Our 3½ Billion Neighbours on Planet Earth") featured in the July 1971, issue of the "Unesco Courier". Obviously we have not been able to reach all of the biologists around the world who might wish to add their signatures to the statement. Those who would like to do so and others who have comments or inquiries can send correspondence to Dai Dong of the Fellowship of Reconciliation at any of the following adresses: Glaciset 32, 2800 Lyngby, Denmark; Box 91, Driebergen 2760, Netherlands; Box 271, Nyack, New York 10960, U.S.A.

Alfred Hassler
Executive Director, Dai Dong
New York

THE PUBLIC AND MODERN ART

Sir,

The Inquiry by the International Council of Museums into public attitudes towards modern art ("Unesco Courier", March 1971) was extremely interesting, but the results are rather disappointing.

Putting to a limited, obviously conservative section of the public the blunt question, "do you like or dislike modern painting?", was bound to lead to one conclusion, namely that the public is hostile to modern art because it goes against traditional concepts of art. But the artist should not merely produce works which please and can be understood by people of average intelligence.

And surely the inquiry was invalidated from the start by a method of presentation that could only baffle the public—a mixture of unidentified works, old and recent, figurative and abstract, famous and little-known, sometimes belonging to several different periods of the same artist.

Dr. Theodore Heinrich, commenting on the results, pointed out that sometimes a particular style of painting may have been familiar to the persons polled but not the particular painting they were shown. These persons would give their preference to famous paintings even if they were not in fact to their taste. We know that if the ordinary man in the street still rejects Mondrian's works, he nevertheless accepts in architecture, painting, fashion and theatre, etc., trends which have been strongly influenced by the works of Mondrian and other often criticized artists such as Malevitch, Kandinsky, Delaunay, Picasso, etc., which goes to prove that the much talked of gap of two generations between the artist and the public does not in fact exist.

On the other hand, we may well ask whether traditional easel and canvas painting is not on the way out, to be replaced in the future by mural art and a synthesis of the arts. If this happens, won't our present conception of museums and art galleries be out of date? If the public no longer goes to see works of art because our museums and art galleries do not attract them, why don't we take these works out into the streets, the factories, the schools and public transport?

D. J. Corre
Chantilly, France

Dr. Theodore Heinrich (member of the Toronto inquiry Committee on public attitudes to modern art) replies:

Our task was to develop and test a practical working method that could be applied in many parts of the world. When that larger study has been done, we shall be justified in starting to draw conclusions.

The "blunt" question, "Do you like or dislike modern painting?", was never asked. The testing materials, which had for fairly obvious reasons to be anonymous, continue to serve their specific purposes quite adequately.

The study was undertaken to provide the museum profession with data upon which to re-evaluate current methods of presentation, interpretation and education in modern art.

Our method allows for proper proportional representation of those already interested, but for the first time begins to represent that large tax-paying public which mostly avoids museums of all kinds, let alone those dedicated to modern art.

The museum-going public is not diminishing and public appetite for art of all periods that it can enjoy and understand constantly increases. But the evidence collected does show a sympathy among this public that decreases in direct ratio with the newness and difficulty of art. We have never suggested that artists or museums should tailor their activities to meet the approval of the broad public (let alone the least common denominator), only that museums question their own methods in order to reduce the clearly existing gap of comprehension.

The sad, cold fact is that Mondrian's own pure and beautiful paintings, for instance, are still "caviar to the general" and the reasons for that are exactly what we are trying to decipher.

UNESCO NEWSROOM

Unesco's 25th anniversary ceremony

Ceremonies to mark Unesco's 25th anniversary are to be held in Paris on November 4 and 5, 1971. This issue of the "Unesco Courier" goes to press before the inaugural ceremony which will be opened by M. Attilio Dell'Oro Maini, president of the 16th session of Unesco's General Conference. The President of the French Republic, M. Georges Pompidou, and the Lord High Chancellor of the United Kingdom, Lord Hailsham, are expected to attend the ceremony as well as Mr. Prem Kirpal, president of Unesco's Executive Board, M. René Maheu, Director-General of Unesco since 1962, and his four predecessors in this post, Julian Huxley (1946-1948), Jaime Torres Bodet (1948-1952), Luther Evans (1953-1958) and Vittorino Veronese (1958-1961). Ministers and high-ranking officials from many countries are to attend as well as several former officials of the Organization.

NEW PRICE OF THE 'UNESCO COURIER'

Repeated rises in production and distribution costs in the past four years have made it necessary to adjust the annual subscription rates and single copy price of the UNESCO COURIER.

On January 1, 1972, our new rates will go into effect as follows:

SINGLE COPY PRICE	1 YEAR SUBSCRIPTION	2 YEAR SUBSCRIPTION
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1,70 French francs	17 F	30 F

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Nag Hammadi bibliography

Since the first publication, in 1948, of information concerning the discovery of Coptic gnostic codices in the vicinity of Nag Hammadi (see the "Unesco Courier", May, 1971), more than 2,400 items have been written about the Nag Hammadi library. Details of the literature published between 1948 and 1969 have now been brought together in a single classified bibliography compiled by David M. Scholer. In addition to works dealing with the Nag Hammadi codices themselves, the bibliography includes materials on gnosticism in general and on certain special topics which provide a context for situating the Coptic gnostic library.

Nag Hammadi Studies, Edited by Martin Krause, James M. Robinson, Frederik Wisse; Volume I, Nag Hammadi Bibliography 1948-1969, by David M. Scholer, E.J. Brill, Leiden, Holland, 1971, 201 pp., 60 Guilders.

People's Republic of China at Unesco

Unesco's Executive Board decided on October 29, 1971, that "From today onwards, the Government of the People's Republic of China is the only legitimate representative of China at Unesco", and it "invited the Director-General to act accordingly." The vote was 25 for, two against and five abstentions.

African art exhibition

An exhibition of African Art, the 10th in Unesco's series of travelling exhibitions, opened recently in 20 different countries throughout the world. The exhibition is made up of 34 display panels with 134 illustrations covering the history of the development of art across the African continent. The exhibition was prepared for Unesco's Division of Cultural Development by three African art experts: Madame Jacqueline Delange, former head of the African section of the Musée de l'Homme, Paris, Mr. Philip Fry, curator of the Winnipeg Art Gallery, Canada, and Mr. Manga Bekombo, French National Centre for Scientific Research, Paris.

SOME BOOKS ON ANGKOR

In English

Lawrence Palmer Briggs
The Ancient Khmer Empire
American Philosophical Society
Philadelphia, 1951

G. Coedès
The Indianized States of South-East Asia
East West Center Press, Honolulu, 1968

J.F. Embree and L.O. Dotson
Bibliography of the Peoples and Cultures of Mainland South-East Asia
Yale University, New Haven, 1950

Bernard P. Groslier
Art and Civilization of Angkor
Translated by Eric Ernshaw Smith
Praeger Inc., New York, 1957

G. and E. Porée-Maspero
Traditions and Customs of the Khmers
Yale University, New Haven, 1953

O. Sitwell
Escape with Me
Macmillan London, 1939

Henri Stierlin
Angkor
Office du Livre, Fribourg, 1970

In French

Georges Coedès
Les Etats hindouisés de l'Indochine
Ed. de Boccard, Paris, 1964
Les peuples de la péninsule indochinoise
Ed. Dunod, Paris, 1962
Pour mieux comprendre Angkor
Ed. A. Maisonneuve, Paris, 1947

Madeleine Giteau
Histoire du Cambodge
Ed. Didier, Paris, 1957
Guide national du Musée de Phnom Penh
Phnom Penh, 1967
Les Khmers, sculptures khmères, reflets de la civilisation d'Angkor
Ed. Office du livre, Fribourg, 1965

Maurice Glaize
Les monuments du Groupe d'Angkor
Ed. A. Maisonneuve, Paris, 1963

Victor Goloubev
L'hydraulique urbaine et agricole à l'époque des rois d'Angkor
Bulletin économique de l'Indochine
Hanoi, 1941

Bernard Groslier
Angkor et le Cambodge au 16e siècle
Ed. P.U.F., Paris, 1958
Indochine, carrefour des arts
Ed. Albin Michel, Paris, 1961
Angkor, hommes et pierres
Ed. Arthaud, Grenoble, 1968
Indochine
Ed. Nagel, Geneva, 1966

Henri Mouhot
Voyage dans les royaumes de Siam, de Cambodge, de Laos
Ed. de Lanoye, Hachette, Paris, 1968

G. de Coral Rémusat
L'art de l'Indochine
Ed. d'Art et d'Histoire, Paris, 1938
L'art khmer, Les grandes étapes de son évolution
Ed. d'Art et d'Histoire, Paris, 1940

Philippe Stern
Les monuments khmers du style du Bayon et Jayavarman VII
Ed. P.U.F., Paris 1965
L'art du Champa
Ed. Douladoure, Toulouse, 1942
Evolution du style indien d'Amaravati
Ed. P.U.F., Paris, 1961

Imp. GEORGES LANG, PARIS. IMPRIMÉ EN FRANCE. — Dépôt légal. 4e trimestre 1971 - C 1

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February

TELEVISION: QUANTITY PLUS QUALITY (M. Esslin). Unesco in the 2nd Development Decade (H. Brabyn). World boom in TV and publishing. New highways for the developing world (W. Owens). The will to peace (Message of Pope Paul VI). Cyclones and other disasters (E. Fournier d'Albe). Latent talent in children (B. Nikitin). Art treasures (52) Serenity of meditation (Korea).

March

THE GENERAL PUBLIC JUDGES MODERN ART (D. Cameron). Quiz on modern art. Unesco Art publications. School for disarmament. Educational aid for Palestinian refugees (R. Maheu). Art treasures (53) 7th century Mayan dancer (Guatemala).

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WHAT FUTURE FOR FUTUROLOGY? (F. Le Lionnais). Breakthrough to tomorrow (R. Jungk). Think tanks and workshops of the future. Futurescapes of the 21st century. A Soviet scientist looks at futurology (I. Bestuzhev-Lada). Pondering the imponderable (P. Piganiol). Art treasures (54) Noble character (China).

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EARLY CHRISTIAN MANUSCRIPTS FROM THE NILE (I. Robinson). Coptic voices from the past (H. Brabyn). Trieste—world rendezvous for physicists (D. Behrman). Funerary art of the Bogomils (M. Krleza). The culture of machine living (M. Lerner). Making learning fun for blind children (E. Freund). Art treasures (55) Katharina, aged 20 (Germany).

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THE MAGIC OF MODERN CHEMISTRY (G. Gregory). A new quality of life. The new chemistry of food. Expanding armoury of drugs. 10,000 metamorphoses of plastics. Mendeleyev's periodic table (G. Teterin and C. Terlon). The missing links of nature (V. Goldanski). Art treasures (56) Captain from Capestrano (Italy).

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S.O.S. ENVIRONMENT. Message from 2,200 scientists. Pollution in Japan (S. Tsuru). Pittsburgh's anti-smoke campaign (E. Stockton). Pollution fight before the U.S. courts (J. Sax). Environmental controls and economic systems (H. Brabyn). Ukraine protects its natural resources (B. Voltovski). Industrialization without pollution in the developing world (I. Sachs). Art treasures (57) Geometry of beauty (Ivory Coast).

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YOUTH OF THE WORLD, YOUTH OF UNESCO (R. Maheu). 25 years of Unesco viewed by a student (E. Naraghi). Seasons of the mind (W. McEwing). In the minds of men, Unesco's anniversary book. Nubia—victory of international solidarity (A. El Sawi). Facts and figures about Unesco. Art treasures (58) Road to asceticism (Ceylon).

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IRAN, CULTURAL CROSSROADS FOR 2,500 YEARS (P. Avery). Scientific legacy of Iran (D. Stewart). Sacred art in Persian culture (S. Nasr). The romance of Varghe and Golshah (A. Melikian-Chirvani). The epic of the kings (J. Santa-Croce). The thousand and one nights (M. Léturmy). Persian poets and writers. Art treasures (59) Fabulous bird-woman (Iran).

November

ANSWERS TO RACISM (O. Klineberg). Inequality before the law in South Africa. The other person's skin (M. Awad). 19th century champion of anti-racism in New Guinea (N. Butinov). Learning the three "T's" in school (A. Mazrui). Unesco's poster contest. Art treasures (60) Women sculptors of Ashanti (Ivory Coast).

December

S.O.S. ANGKOR (H. Daifuku). Angkor: Architecture and ecology (H. Stierlin). The Bayon temple at Angkor (P. Stern). Rediscovery of the temples of Angkor (M. Giteau). Daily life in 13th century Cambodia: Chinese Chronicles (Chou Ta Kuan). Bayon bas-reliefs (S. Son). Art treasures (61) Angkor (Khmer Rep.).

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EVERYDAY LIFE IN 12TH CENTURY ANGKOR

The temples of Angkor (Khmer Rep.) are considered one of the greatest architectural complexes in all Asia. And among the wonders of Angkor, the Bayon temple, with its multi-faced towers and sculpted walls literally covered with thousands of scenes from everyday life, stands out as the acme of Khmer architectural and artistic achievement. Depicted here are traders, surrounded by their wares, taking a hasty nap as they wait for their customers to arrive. (See pages 30-38 for a series of exceptional photo-studies of this "diary in stone").